

REPORT
OF THE
ENGINEER AND ARTILLERY OPERATIONS
OF THE
ARMY OF THE POTOMAC,
FROM ITS ORGANIZATION TO THE CLOSE OF THE
PENINSULAR CAMPAIGN.

BY
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AND
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ILLUSTRATED BY EIGHTEEN MAPS, PLANS, ETC.

NEW YORK:
D. VAN NOSTRAND, 192 BROADWAY.
1863.

Entered according to Act of Congress, in the year 1863,

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C. A. ALVORD, STEREOTYPER AND PRINTER.

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THE PENINSULAR CAMPAIGN.

GENERAL BARNARD'S REPORT.

WASHINGTON, *January* 26, 1863.

BRIG.-GEN. R. B. MARCY,
Chief of Staff, &c.

GENERAL :—In compliance with the request of Major-General McClellan, I make the following report of the Engineer operations of the Army of the Potomac, executed under my directions as Chief Engineer of that army, from the time of its organization to the date at which it was withdrawn from the James River.

On the night of the twenty-third, twenty-fourth of May, 1861, a portion of the force which had been raised, under the different calls of the President for three months and three years volunteers, crossed the Potomac by the Long Bridge, by the Aqueduct, and by steamers, to Alexandria, seized the City of Alexandria, the heights of Arlington, and intermediate connecting points.

As *têtes-de-pont* to the Long Bridge and Aqueduct, Forts Runyon and Corcoran, the sites of which had been previously reconnoitred under my directions, were com-

menced at daylight on the morning of the 24th. The same day a reconnoissance was made in the vicinity of Alexandria by Captain Wright, Engineers (now Major-General U. S. Volunteers), and Fort Ellsworth, to secure our possession of that city, was commenced. A couple of weeks later, I laid out Fort Albany (intended to command the Columbia and the Aqueduct and Alexandria roads, and to give greater security to our *débouché* by the Long Bridge), which was commenced under Captain Blunt, Engineers.

These works were all of considerable magnitude (Fort Runyon having a perimeter of 1,500 yards). They were not entirely completed, though very nearly so, and quite defensible, at the date of the advance of the army under Gen. McDowell (July 16).

I give this brief account of these preliminary works, because they formed the initiation of the system of "Defences of Washington."

On the return of the army from the campaign of Bull Run, the policy of surrounding Washington by a complete system of defensive works was no longer doubtful.

Major-General McClellan, on his assumption of the command of the Army of the Potomac, was prompt to recognize the necessity of further fortifications, especially urgent at that time. In as rapid succession as possible, and in the order of the most urgent importance, new works were commenced.

The interval between Fort Corcoran and Fort Albany was filled by series of works forming a continuous line, within supporting distance, protecting the heights of Arlington. At the same time, the most prominent

points on the north of the Potomac, and those controlling the important routes leading to the Capital, were occupied by strong works.

It was soon apparent that Fort Ellsworth, important as that work still is, was inadequate for the defence of Alexandria.

It was found necessary to occupy with a powerful work the heights over Hunting Creek, and to form a line of works embracing the Seminary heights, and connecting with our Arlington lines at Fort Albany.

About the middle of September, a portion of the army crossed the Chain Bridge, and occupied the south shore of the Potomac at that point. The same night strong works, the site of which had previously been reconnoitred by Major (now Brigadier-General) D. P. Woodbury, were commenced for holding this *débouché*.

On the 29th of September (I think it was), the army advanced to the position of Upton's and Munson's Hills, and the works of Forts Ramsay, Buffalo, &c., were commenced and speedily finished.

In September, the fortification of the heights over Eastern Branch was commenced. During the subsequent months of the autumn and winter, the engineers, assisted by large details of troops, and also by large gangs of hired laborers, were busily engaged in completing the system which, as you will observe, now extended from a point below Hunting Creek, near Alexandria, to the Chain Bridge; thence from the Potomac to the Eastern Branch near Bladensburgh; and thence along the heights south of the Eastern Branch to a

point nearly opposite Alexandria,—making a total development of thirty-three miles.

I refrain from making here an exact enumeration, or a minute description of the works. A report to the Chief Engineer U. S. A., made by me Dec. 10, 1861, in compliance with a resolution of the House of Representatives (a copy of which was furnished to Major-General McClellan), will furnish all such details; they should not be made public. I incorporate in this report the following extracts.

* * * * *

The theory of these defences is that upon which the works of Torres Vedras were based; the only one admitted at the present day for defending extensive lines. It is to occupy the commanding points within cannon range of each other by field-forts, the fire of which shall sweep all the approaches. These forts furnish the secure emplacements of artillery. They also afford cover to bodies of infantry. The works may be connected by lines of light parapets, or the ground (where practicable) may be so obstructed that the enemy's troops cannot penetrate the interval without being exposed, for considerable time, to the destructive effects of artillery or musketry fire of the forts.

With such a system established, the defence against a powerful attack requires that all the forts shall be garrisoned; that a certain amount of infantry, cavalry, and movable artillery be distributed along the lines, sufficient to hold them until reserves can be brought to support; and, finally, it requires a movable force held as a reserve, which may be shifted from point to

point, to meet the enemy's effort wherever it may be made, and where, aided by the works, they can repel prior numbers.

It is evident that *without* fortifications a place cannot be considered secure, unless held by considerably *greater* numbers than the enemy can bring to assail it. No less an authority than Napoleon says that, aided by fortifications, 50,000 men and 3,000 artillerymen can defend a Capital against 300,000 men, and he asserts the necessity of fortifying all national Capitals.

The engineer forces attached to the army of the Potomac, as it was constituted during its campaign on the Peninsula, consisted of a brigade of two regiments of volunteer engineers (the 15th New York, Colonel John McLeod Murphy, and the 50th New York, Colonel Charles P. Stuart), commanded by Brigadier-General (Major of Engineers U. S. A.) D. P. Woodbury, and of a battalion (three companies) of regular engineer troops, commanded by Captain J. C. Duane, engineers.

The two regiments of volunteers had been placed under charge of Lieutenant-Colonel (A. D. C.) (Captain of Engineers U. S. A.) B. S. Alexander, in October, 1861, for instruction in the duties of engineer troops.

The same officer had superintended, assisted by Captain Duane and Lieutenant Comstock, the getting up of pontoon trains and other engineer equipage. Previously to the embarkation of the army he was taken sick, and was thereby prevented from taking charge of the brigade, though he rejoined the army soon after its arrival before Yorktown.

The battalion of regular engineers was organized and

instructed by Captain Duane, assisted by 1st Lieutenants C. P. Reese, C. E. Cross, and O. E. Babcock, which three last-named officers commanded the several companies of the same.

The engineer equipage consisted of about 160 bateaux or wooden pontoons of the French model, with the necessary balks, chess, anchors, cordage, &c. There were also a certain number (of which I do not now find any exact statement) of Birago trestles, and Russian canvas boats.

As originally got up, this bridge equipage was organized in *trains*, of which there were six regular trains, consisting each of thirty-four French pontoons and eight Birago trestles, calculated to make a bridge of about 250 yards in length; and an advanced guard train composed of Birago trestles and Russian canvas boats. The wagons for but four of the regular trains and for the advanced guard were provided.

All or nearly all the above bridge equipage was taken to the isthmus, but it did not retain its organization, except, I believe, one regular train taken along with the engineer battalion. The miscellaneous demand for bateaux for bridging Wormley Creek, at the siege of Yorktown, for Quartermaster's use at Cheeseman's Landing, for the disembarkation of Gen. Franklin's division, &c., &c., rendered impossible and unnecessary the preservation of such an organization. A large portion of this equipage was in actual use for the purposes above named during the siege of Yorktown. On the advance of the army, the single bridge train of the engineer battalion accompanied it; part of the re-

maining equipage being in depot at Fort Monroe, and the rest taken up by water to "White House."

Thirty wagons for engineer tools were prepared, containing the special tools required for engineer troops. Twenty of these accompanied the engineer brigade, and ten accompanied the engineer battalion. Besides these, tool-wagons were provided to carry intrenching tools sufficient for the engineer troops. For the general service of troops in intrenching or siege-works, tools were supplied by the Quartermaster's department.

The works prepared by the enemy, to resist a landing at any point of the Peninsula south of Yorktown, or an advance from Fort Monroe, having been abandoned, the engineer operations of the army commenced with the siege of Yorktown. These works, however, such as that at Ship Point, and others near the head of Wormley Creek, were of considerable magnitude.

My special report of the siege of Yorktown (a copy of which is furnished you) will preclude the necessity of any further account in this place.

I should have mentioned that, besides the engineer officers and troops already enumerated, the following engineer officers accompanied the army:

Lieutenant-Colonel (A. D. C.) B. S. Alexander,

1st Lieutenant C. B. Comstock,

1st do M. D. McAlester,

1st do W. E. Merrill.

Captain C. S. Stewart,
2d Lieutenant F. U. Farquhar, { These two officers were temporarily detached from their duties at Fort Monroe, and joined the army about the middle of April.

2d Lieutenant F. U. Farquhar, } roe, and joined the army about the mid-
1st Lieutenant H. L. Abbot, } die of April.
Topographical Engineers. } This officer having been detailed for en-
} gineer duty on the defences of Washing-
} ton, accompanied me as an aide through-
} out the campaign.

1st Lieutenant H. L. Abbot, { This officer having been detailed for engineer duty on the defences of Washington, accompanied me as an aide throughout the campaign.

At the-commencement of the siege operations, Colonel

Alexander (assisted by Lieutenant McAlester) was charged with the very important duty of constructing the roads through the various ravines of Wormley Creek, which formed our main communication with the siege-works. On the 20th of April he was attached to the head-quarters of Brigadier-General W. B. Franklin, whose division was then preparing for a landing on some point of the enemy's shore.

Lieutenant Comstock, during the siege, acted most of the time under the immediate orders of Captain Duane, with whom he continued until after the battle of Fair Oaks. He was afterwards attached to the head-quarters of General Sumner.

Lieutenant McAlester was attached to the head-quarters of General Heintzelman throughout the campaign.

Lieutenant Merrill was attached to the head-quarters of General Keyes. At the action in front of the "one-gun battery," April 16th, he was severely wounded in the arm. He was "*hors de combat*" for the remainder of the campaign, and was brevetted for gallant services on that occasion.

Captain Stewart and Lieutenant Farquhar were attached to General Sumner's head-quarters during the siege. On the advance of the army they accompanied the advanced guard under Brigadier-General Stoneman, with whom they remained until the arrival on the Chickahominy, where Captain Stewart was taken sick, from over-exertion, and obliged to return to Fort Monroe. Lieutenant Farquhar was subsequently assigned to duty with General Sumner's head-quarters.

I directed full plans of the works, constituting the

strong defensive line extending across the Peninsula at Williamsburg, to be prepared, but they were never made. A sketch, however, showing the general character of the line, and the positions of the works, was made from reconnoissances of Lieutenant McAlester; and it is, I believe, in the possession of the Commanding General.

Previous to the fall of Yorktown, the division of Brigadier-General W. B. Franklin had been held in readiness to be embarked and landed at such a point on York River as subsequent events might dictate. The preparations for these operations had been directed by Lieutenant-Colonel B. S. Alexander. The division actually made a landing nearly opposite West Point, which was followed by a severe engagement with a portion of the enemy's forces. I enclose a report of Colonel Alexander herewith, concerning the engineer operations. (Sub-Report, No. 1.)

In the movements of the army, in its advance from Yorktown, the officers of engineers were employed in various reconnoissances of the routes, of the York and Pamunkey Rivers, &c.; while detachments from General Woodbury's Engineer Brigade repaired roads and bridges. After reaching a point near Roper's Church on the Williamsburg and Richmond road, the right wing, consisting of the corps of Porter and Franklin, took the road *via* Cumberland and the White House, striking the Chickahominy at "New Bridge," while the left (corps of Heintzelman and Keyes) kept the Richmond road to Bottom's Bridge. The advanced guards reached these points about the 16th or 17th.

On the 20th I proceeded, by orders of the Commanding General, to make a forced reconnoissance of the position of Bottom's Bridge, accompanied by Lieutenants Comstock and McAlester.

On arriving, I found the ground already occupied by a portion of the division of General Casey, and I dismissed the force I had ordered. The result of the reconnoissance was the acquiring of a very perfect knowledge of the character of the Chickahominy as an obstacle, and the presumption that at this point (Bottom's Bridge) no serious resistance was contemplated. In fact, the next day our troops crossed and occupied the other bank.

General Woodbury, with his brigade, was ordered to this point to repair the old bridge and the railroad bridge, and to establish others; while Lieutenants Comstock and McAlester made a reconnoissance in force on the right bank, with the view of establishing a *tête-de-pont* to cover both Bottom's Bridge and the railroad-bridge. This work was begun, but never entirely finished.

On the 22d the general head-quarters reached Coal Harbor, and I proceeded immediately to the New Bridge, to reconnoitre that position. A word is proper here concerning the Chickahominy, which, at the season we struck it, was one of the most formidable obstacles that could be opposed to the advance of an army; an obstacle to which an ordinary *river*, though it be of considerable magnitude, is comparatively slight. The Chickahominy, considered as a military obstacle, consists of a stream of no great volume, a swamp, and a bottom-land.

The stream flows through a belt of heavily timbered swamp, which averages three to four hundred yards wide. A few hundred yards below New Bridge is a short length of the stream *not* margined by swamp timber; but everywhere else between New and Bottom's Bridges, the belt of swamp timber is continuous and wide. The tops of the trees rise just about to the level of the crests of the highlands bordering the bottom; thus perfectly screening from view the bottom-lands and slopes of the highlands on the enemy's side. The disappearance, in the place indicated, of swamp timber near New Bridge, and the dwindling away of the same, at some points above the bridge, to isolated trees, gave us some glimpse of the enemy's side near this point.

Through this belt of swamp the stream flows, some times in a single channel, more frequently divided into several; and, when but a foot or two above its summer level, overspreads the whole swamp.

The *bottom-lands*, between the swamp and the highlands, are little elevated at their margins above the swamp, so that a few feet rise of the stream overflows large areas of them. They rise very gently towards the foot of the highland slopes. These bottom-lands are generally cultivated, intersected by deep ditches, and their lower portions are, in wet weather, even when not overflowed, spongy, and impracticable for cavalry and artillery. The total width of bottom-land varies from three-fourths of a mile to a mile and one-fourth.

The crests of the opposite highland spurs are about a mile and a half or a mile and three-quarters apart. The road *via* Coal Harbor to Richmond crosses the

stream by a wooden bridge (on piles), which had been destroyed. After passing the bridge, the road or causeway takes a direction oblique to the course of the stream (having reaches nearly parallel with it), and ascends the opposite heights by a ravine, at a point nearly a mile from the bridge. Above New Bridge, the character of the stream and margins is not much different from what has been described, though the swamp was somewhat less regular in its width and density. The Mechanicsville and Meadow Bridges each consisted of *several* bridges; crossing different arms of the stream, the swamp being wide at both places. These were the only bridges and roads crossing the stream in the vicinity of the positions of the army.

The distance from New Bridge to Bottom's Bridge is eight miles. In this space there were two or three indifferant summer fords, or places where a pedestrian could make his way through the swamp and stream; but it was currently reported, at the time of our arrival, that the stream was nowhere fordable.

The knowledge of the Chickahominy gained at Bottom's Bridge, showed me that the stream might be reached at almost any point with little risk, and thoroughly examined, provided the enemy's pickets did not actually hold our side. Taking with me Lieutenant Custer, of Fifth United States Cavalry, I reached it at a point three-fourths of a mile below New Bridge, and caused him to enter it. He waded across without any difficulty (the depth being about four feet); and a few days afterwards, emboldened by this experiment, he caused the length of the stream to be waded from the

bridge for half a mile down. The attack and capture of the enemy's pickets, by him and Lieutenant Bowen, was founded upon these reconnoissances, to which the successful results are due.

Although it was thus shown that the stream was no obstacle for infantry, the swamp and the bottom-lands were impracticable to cavalry and artillery. It was necessary to provide bridges and (except at the site of "New Bridge"), to corduroy a certain length of road on each margin. Three points were selected: New Bridge, a point a mile above, and another the same distance below.

The bridge materials and corduroy stuff were collected, and deposited at convenient points. At the same time General Sumner, whose corps had been stationed at a point intermediate between New Bridge and Bottom's Bridge, constructed two corduroy bridges across the stream and swamp, one of which was completed on or before the 28th, and the other on or before the 30th May. So far as engineering preparations were concerned, the army could have been thrown over as early as the 28th; Sumner uniting his corps to those of Heintzelman and Keyes, and taking the enemy's position at New Bridge in flank and rear. Thus attacked, the enemy could have made no formidable resistance to the passage of our right wing.

I had twice reconnoitred the other side of the Chickahominy, and on the 28th found General Nagley's (Casey's division) pickets holding the very edge of the large wheat-field occupying the highlands immediately facing our position at New Bridge. On the 30th I reported the reconnoissance, and reached Golding's house

a point overlooking our *débouché* from the New Bridge, at a distance of a mile and a half.

I returned from that reconnoissance in the torrents of rain which commenced to fall that afternoon, and which continued during the night, completely changing the whole aspect of affairs.

On the afternoon of the 31st the enemy threw himself upon our left wing, doubtless believing that it was, by the swollen condition of the Chickahominy, entirely isolated.

Fortunately, General Sumner succeeded in getting over both divisions of his corps and one battery, though Richardson, finding the lower bridge impassable, was obliged to make a *détour* to the upper one, and did not arrive in time to take part in the action that evening. Soon after the upper bridge became impassable.

Orders from head-quarters were given for throwing, that night, the bridges at the points selected at and near "New Bridge." The night was intensely dark, and the dense foliage of the swamp excluded any little light there was in the heavens. The stream which, during the day, had slowly exhibited the effects of the storm, rose rapidly during the night. Captain Duane, who, at the New Bridge, had the simplest task of all,—that of bringing his pontoons into position between existing abutments,—found the darkness, the powerful current, and the rising stream, too much to contend with, and postponed his operations till daylight.

At the upper point, the bridge materials (trestles), which had been deposited near the site, under cover of the swamp timber, were found to be afloat; this, with

the much more difficult character of the task than that of Captain Duane's, prevented any progress during the night.

At the lower point the same or even greater difficulties were encountered.

The direction of the bridge, chosen while the water was down, and well chosen, was found inadmissible after a rise of a couple of feet.

Detachments of General Woodbury's brigade had charge of the construction of these two last-named bridges. He reports to me:

"At 1.30 P. M., when the battle began over the river, I was at work two miles below New Bridge, on a bridge or set of bridges over the Chickahominy: I comprehended in an instant the full import of the attack, and hastened back to prepare for bridges. The six teams left to me I caused to be harnessed up, and added to them as many teams as I could raise in my brigade. . . . About 10 o'clock in the night of the 31st ult. I received orders to commence bridges immediately."

The three sub-Reports herewith (numbered 3, 4, 5), of the officers charged with the construction, will show the difficulties encountered. General Woodbury adds:

"No fault can be found with the officers or men of the engineer brigade. I have never seen officers work with more zeal, or men work harder, than they have done during the last two days. Only by more familiarity with the drill could they have had more experience available for the recent emergency."

The result of the operation was, that at 8.15 A. M. (June 1st), the pontoon bridge at the site of New

Bridge was complete, and passable to infantry, cavalry, and artillery. About noon the "upper trestle bridge" was practicable for infantry. It was not till night that a practicable bridge for infantry was obtained at the "lower trestle bridge."

In reference to these two trestle bridges it must be observed that the "bottom land" adjacent, dry, or nearly so, when we selected the sites, was overflowed or rendered boggy for half a mile on one or the other side, and could only be made passable to cavalry or artillery by corduroying; a work which could not be done over so much water-covered ground in one day or two days, nor done at all, on the enemy's side, under his unsubdued fire, as subsequent experience proved.

At 8.15 A. M., the moment when the "New Bridge" pontoon bridge was being completed, I was on the spot. I have observed that the road crossing at this point was a raised causeway. On our own side the water had overflowed this causeway in two or three places near the bridge. On the other side were similar places. Anxious to ascertain how practicable the route was, I directed Lieutenant Babcock to proceed, with a few of his sappers, as far as he safely could on the other side. He proceeded perhaps two hundred yards, when he was fired upon by sharpshooters ambuscaded in the vicinity, and one of his men shot through the lungs. Supporting the wounded man himself, he withdrew, followed by repeated volleys. The intense anxiety I felt at this moment was partially relieved when I ascertained that it was not Lieutenant Babcock himself, as I supposed, who was shot.

Although these overflows of the causeway existed on

both sides, the road surface was hard, and, at that time, practicable for artillery. Later in the day, the water continuing to rise, and flowing over with a powerful current, cuts were made so deep that artillery could not pass until these were bridged. Whether this happened, too, on the enemy's side (where the road, as stated, was likewise overflowed), there were no means of knowing.

At a later hour (perhaps 10 or 12 o'clock, for I find no record), I was again at these bridges. Of the results of the battle we knew (or I knew) nothing. The enemy held with artillery, and undisturbed, the opposite heights. It was evidently impossible to pass here with our infantry, artillery, and cavalry confined to this narrow causeway; for I do not believe that even infantry in any numbers, in fighting order, could have passed over (opposed by the enemy's fire) the overflowed and ditched lands that interposed between the two trestle bridges and the enemy's positions. I so reported (in writing, I think, though I find no copy) to yourself. There was one way, however, to unite the army on the other side; it was to take advantage of a victory at Fair Oaks, to sweep at once the enemy from his position opposite New Bridge, and, simultaneously, to bring over by the New Bridge our troops of the right wing, which would then have met with little or no resistance.

It should have been observed, that soon after passing the Chickahominy at Bottom's Bridge, General Keyes was directed to advance, and to select and fortify a strong position on the Richmond road. He commenced fortifying a position about a mile in advance of Savage's Station, and a mile and a half behind the "Seven Pines."

It was deemed necessary by the Commanding General to hold the position of the Seven Pines (the junction of the "nine-mile" road with the Williamsburg road), and by his order I directed Lieutenant McAlester to select and fortify a position. Lieutenant McAlester found the point held by Brigadier-General Casey's division, and some slight rifle-pits, abatis, etc., were made. He selected a position a half mile in advance of the Seven Pines, which he deemed more tenable than the first. On visiting this ground on the 28th, I directed the commencement of a redoubt, rifle-pits, felling of trees, etc. Lieutenant McAlester was unable to procure an adequate force to throw up rapidly a defensive line, and this redoubt was quite incomplete when the attack at this point was made, about 1.30 P. M. of the 31st. A few pieces of artillery were placed in it behind the unfinished parapet, and in attempting to spike them, I think it was, the gallant Colonel Bailey lost his life.

By the rise of the Chickahominy the two bridges built by General Sumner became impracticable by the night of the 31st. The bridges at Bottom's Bridge with difficulty were preserved from destruction, but the rising waters overflowed the adjacent road, and soon those bridges became useless for wagons or horses. Fortunately, the railroad bridge had been repaired, and by this alone the left wing of the army was supplied. By means of planks laid between the rails, infantry and, with some risk, horses could pass. This, for several days, was the only communication between the two wings of the army.

Immediately after the battle of Fair Oaks, Lieuten-

ant McAlester was directed to complete the redoubt already mentioned, and to extend the defensive line to the right to embrace Fair Oaks, and to the left to connect with the White Oak Swamp. At the same time Colonel Sully, under General Sumner's orders, commenced a line of barricades, continuing the line towards Golding's house. Lieutenants Comstock and Farquhar were ordered to General Sumner's head-quarters to aid in this work, make reconnoissances, &c.

Colonel Alexander took, by your orders, immediate charge of the bridges, and a vigorous effort was made to corduroy the approaches on each side, a thing indispensable to making the two trestle bridges practicable. The labor was completely thrown away. After being permitted to go on for a few days, it was arrested by the enemy's fire, and the approaches on the enemy's side to these two bridges never did become practicable.

Two days after the battle of the 1st (viz. June 3d), I was directed to join General Sumner's head-quarters temporarily. Previous to leaving, I had urgently recommended the construction of a bridge at a point not far below the lower trestle bridge, where the *débouchés* on each side could be completed out of view of the enemy and under the protection of our own forces, now holding Golding's house. General Woodbury and Colonel Alexander made an exploration of the stream (under direct orders from head-quarters) and selected a point for a bridge, favorable enough otherwise, but failing in the important object of bringing the two wings of the army into immediate connection, it being but three or four hundred yards above Sumner's upper bridge.

This bridge was built over the stream upon frame trestles; through the swamp it was supported by cribs. The *approaches* to the bridge over the low bottom-lands were either raised corduroy or (on the north side) simply earth raised two or three feet (the soil being here sandy), with a layer of brush one foot below the upper surface; deep lateral ditches being made. The whole structure of the bridge and approaches was about fourteen hundred yards long. The trestle-work and crib-work bridge was mostly done by troops of the Engineer brigade under General Woodbury; the approaches on the north, by the 9th and 22d Massachusetts regiments (Colonels Cass and Gove, both of whom were killed in the battles following), and those on the south side by the 3d Vermont. The bridge was ready for the passage of teams on the 14th, covered with earth, and the approaches entirely completed on the 17th. The bridge proper was 1,080 feet long; roadway, 11 feet wide; number of cribs, 40; of framed trestles, 6.

Simultaneously two *infantry bridges* were made across the swamp, by the Engineer brigade: one a short distance below the "Lower Trestle Bridge;" one nearly opposite Golding's, where an old summer ford had been found, and where General Nagley had commenced a bridge previous to the battle of Fair Oaks.

To complete the history of bridges, I would add that, on my return from General Sumner's head-quarters, I still urged the necessity of a still more direct communication, practically for all arms, between the two wings of the army, the two "trestle bridges" having been virtually abandoned. The point suggested by me being con-

sidered too much exposed, the Commanding General himself selected a point somewhat lower down, where the *débouché* was entirely covered by our lines near Golding's; and this bridge was commenced by Captain Duane's Engineer battalion (assisted by troops of General Porter's and General W. F. Smith's command) on the 10th or 11th. The structure was about equal in magnitude to that already described. It was finished on the 18th or 19th.

Besides the work described, detachments of the Engineer brigade or Engineer battalion were at work on the corduroy communication with the bridges, commenced the night of the 31st; repairing and corduroying roads, rebuilding Bottom's Bridge, &c.

We had, June 19th, the following bridges:

"Upper Trestle Bridge."—*Débouchés* held by the enemy, and incomplete on his side.

"The New Bridge."—Two pontoon bridges—Captain Duane having built a second one alongside the one completed June 1st. The road was held on south side of Chickahominy by the enemy.

"Lower Trestle Bridge."—*Débouchés* held by enemy, and incomplete on his side.

The "Foot Bridge."—Available for infantry under certain circumstances. It was on the shortest line between the two wings of the army.

"Duane's Bridge."—A fine structure, practicable for all arms, and affording a very direct communication.

The "Infantry Bridge" (of Woodbury).—Available for infantry.

"Woodbury and Alexander's Bridge."—For all arms.

"*Sumner's Upper Bridge*," or the "*Grape-Vine Bridge*."—This had been put in condition to be used in emergency by all arms.

"*Sumner's Lower Bridge*," I think, had never been repaired.

The Railroad Bridge was the means of bringing up most of the supplies to the left wing. Bottom's Bridge was kept up, and the *tête-de-pont* held.

While at General Sumner's head-quarters (June 4th to June 7th), I laid out a redoubt at Golding's (No. 6 on "Campaign Map" No. 3), and directed Lieutenant McAlester to lay out two others (Nos. 4 and 5), and to complete No. 3 (the one first commenced, and where Colonel Bailey was killed).

Lieutenant Comstock, assisted by Lieutenant Farquhar, was directed to have the lines complete from No. 6, to connect with McAlester's works. The woods in front were extensively slashed, as shown on the campaign map. Lieutenant McAlester, in reconnoitring on the 5th, had his horse shot under him by the enemy's pickets, and narrowly escaped capture. Subsequently, redoubts Nos. 1 and 2 were constructed, carrying the left to the White Oak Swamp.

The redoubts may be described as follows:

- | | | | |
|--------|--------------------------------|-----------|---------|
| No. 1. | A lunette with open gorge, | | 8 guns. |
| " 2. | A redan, " " " | | 6 " |
| " 3. | An enclosed redoubt (irregular | | |
| | pentagon), | | 5 " |
| " 4. | An enclosed redoubt, | | 9 " |
| " 5. | " " (irregular), | | 6 " |
| " 6. | An " square of 30 yards wide, | | 6 " |

The works were connected by rifle-pits or barricades. The object of these lines (over three miles long), was to hold our position of the left wing, against the concentrated force of the enemy, until communications across the Chickahominy could be established; or, if necessary, to maintain our position on this side, while the bulk of the army was thrown upon the other, should occasion require it; or, finally, to hold one part of our line and communication by a small force, while our principal offensive effort was made upon another. Such an offensive effort it was the understood purpose of the Commanding General to make upon our right, driving the enemy from the large wheat-field (where he opposed the passage of our right wing), and from his position at the "Old Tavern," thus putting ourselves upon the "Nine-Mile Road" to Richmond, and within five miles of that city. Reconnoissances with this view were constantly made by the engineers; roads and bridges across the ravine, which separated our right wing from the enemy, prepared, &c.

At the same time, several batteries were constructed, under the direction of Captain Duane, on the left bank of the Chickahominy, either to operate upon the enemy's positions and batteries opposite, or to defend our bridges, &c. They were,

- | | | |
|--------|-----------------------------------|---------|
| No. 1. | Near Dr. Gaines's house, | 6 guns. |
| No. 2. | On left of road, near New Bridge, | 6 guns. |
| No. 3. | " right " " " | 6 guns. |
| No. 4. | " " of Hogan's house, | 6 guns. |

This last was armed with siege ordnance, I think, and used with success against the enemy's batteries. Sev-

eral of these siege guns, and the two 8-inch siege howitzers, were brought up to put either in, or in the vicinity of, redoubts Nos. 3, 4, and 5.

Our reconnoissances showed that the enemy was throwing up works on the farther side of the "large wheat-field," and in the neighborhood of "Old Tavern;" also in front of our lines, from redoubt No. 2 to No. 5. It was impossible to distinguish the exact character of these works, though most of them were probably little more than rifle-pits.

In order, as I understood it, to drive back the enemy's pickets, and to throw forward our own, General Hooker was ordered on the 25th to push his division forward through the woods to the clearing, three-fourths of a mile beyond his lines, and between the Williamsburg road and the railroad. Hearing the firing in the afternoon from that locality, I pushed forward on the Williamsburg road to the further edge of the woods (then held by our troops), with a hope of getting some better knowledge of the ground and works of the enemy. An opening of 1,200 or 1,500 yards extended before me, and I saw guns in position, and tents partially hid by a depression in the ground, but no appearance of works. In returning, my horse was struck by a shell, and disabled.

In view of an advance to drive the enemy from the "wheat field" on our right, it was decided, as a preliminary, to construct an epaulement for putting our guns on a commanding point on the edge of the field, and near our picket lines. Colonel Alexander, with a large detail, broke ground at dark on the night of the 26th, within musket range of the enemy's pickets, and suc-

ceeded by morning in obtaining cover without loss. The enemy did not interfere in any manner with the execution of this work, having, probably, other designs.

It had been known, some days previous to this, that Jackson's command had reached Frederickshall station, on its way from the Shenandoah, and there was presumptive evidence that an attack on our right wing was meditated by the concentrated forces of the enemy, and that, too, on the 27th. It was understood by me to be the intention of the Commanding General to concentrate our own forces either on one side or the other of the Chickahominy; and so far as I could infer, from a conversation in which no positive decision was announced on his part, the plan to which preference was given was, after the enemy's plans should be sufficiently developed, to withdraw from the left bank of the Chickahominy, concentrate on the right bank, and attack Richmond while the enemy was massed on the other side. Indeed, the work thrown up on the night of the 26th, was understood to be a preparation for an attack to be made on the morning of the 27th.

On the afternoon of the 26th, I was told by the Commanding General, that in case of withdrawing from the other side (left bank), he would still be glad to maintain his hold on that side, in order to be able to recross, should events make it necessary or desirable. I said to him, that I thought with any small force it was impracticable to hold the *débouchés* of all our bridges, or even those from Duane's down to Sumner's upper bridge, but that, possibly, the heads of the two important bridges, "Alexander and Woodbury's," and "Sumner's

upper bridge" (which were within a few hundred yards of each other), might be held. He desired me to go that afternoon and reconnoitre the ground for a position for that purpose. This was probably about 4 P. M.

I left the head-quarters camp (then rear of Dr. Trent's) as soon as I could get my horses, and proceeded on this reconnoissance. I had passed the Chickahominy when I was overtaken by an aide-de-camp (Lieutenant Custer), who informed me that the Commanding General desired to modify his instructions; that he wished me to reconnoitre a position extending from near Doctor Gaines's to Barker's mill-pond. He (Lieutenant Custer) asked for my map, and sketched with a pencil a line extending between those limits. How, or by what forces, it was intended to occupy that position, I was not informed.

I took the road by "McGee's house" to New Coal Harbor and to Doctor Gaines's; thence back on to the spur on the right of Doctor Gaines's; thence through the woods to New Coal Harbor again; thence to Old Coal Harbor; thence by the road to Dispatch Station to near where I started; thence by the same road to near Barker's saw-mill.

It was late when I commenced, and I had been obliged to ride fast. When I reached Barker's mill it was getting dark, and I proceeded from thence back to camp. I thought that a position moderately favorable for a large force to fight a battle, in equal or not greatly inferior numbers, might be taken along this line, but not one which gave any very decided advantages. According to the force in which it was occupied, its left would rest on the first spur to the right (east) of Dr. Gaines's house,

embracing the woods; or, by contracting the front, rest on the spur where "Watts's house" is, partially embracing the woods in front, and running in front of McGee's house. The right would extend past McGee's house, along the "Dispatch Station" road through the woods, to the eminence near where a house is marked on the map; or, perhaps, still better, keep along the edge of the woods towards the Chickahominy.

When I returned to head-quarters camp after dark, I found that the Commanding General had left for General Porter's camp, having been summoned either by General Porter himself, or by the sound of the attack made late that afternoon. At 10 P. M. I received a telegram directing me to repair at once to General Porter's headquarters. I reached there about midnight, and found the Commanding General and General Porter together, in bivouac (all camp equipage, wagons, etc., having been sent to the other side). After explaining on the map to the Commanding General what I had done in the afternoon, he rose to leave, intimating that he desired me to remain with General Porter.

On his leaving, General Porter seemed to be in doubt whether he should withdraw his troops from their actual positions. Finding he had no positive instructions, I told him that I supposed it indispensable to fall back, at least to the position covering the bridges, in order to put himself in communication with the rest of the army; and he issued his orders to this effect about 1 A. M., and at dawn or early daylight the troops were in motion near us, falling back.

At this time the doubts seemed to have revived in

General Porter's mind as to the expediency of the movement, he alleging the probability of McCall's division being cut to pieces in the operation; I could only repeat my conviction that it was indispensable, in order to put himself in connection with the rest of the army, and it was continued; and we proceeded together to the ground I visited the evening before. On the way, or before starting, he asked me how many troops I thought he ought to be re-enforced with. I replied substantially that I could not answer the question; that, according to any understanding I had of the matter, I supposed the whole army was to fight on one side or the other; that I had all along supposed he was to retire to the other side.

After reaching the ground, he decided to put his left on the spur of "Watts's house," and, riding further along the position, he concluded he could not extend his right beyond the clearing and spur where McGee's house is. After this I returned to head-quarters, presuming that, in reference to the arrangements of the day, the Commanding General might have further instructions for me. I reached head-quarters about 9 or 10 A. M., and, being informed that the Commanding General was reposing, I went to my tent and remained there until afternoon.

I have gone somewhat minutely into the history of my connection with that battle-field, because upon this battle, fought by General Porter with 27,000 men, hinged the fate of the campaign.

On the afternoon of the 26th, Lieutenant Reese was sent by Captain Duane (who had orders, I presume, direct from head-quarters) to destroy the "upper trestle"

and "New Bridge." He found the first already taken up by a detachment from the Engineer brigade, the trestles being destroyed, and the flooring collected on the bank for burning. He took up the pontoons of the two bridges at "New Bridge," loaded them with the flooring, and attempted to float them down the stream to the lower trestle bridge; but, being unable to get them along the channel, scuttled and sank them one or two hundred yards below the bridge site. The afternoon of the 27th, Colonel Alexander thoroughly destroyed "Duane's bridge." General Porter's forces passed over the two lower bridges in the night, and Captain Duane had orders to see all those bridges destroyed.

That night it was understood, I believe, that the army was to march to the James River. General Woodbury received orders from head-quarters to proceed immediately to the White Oak Swamp and construct bridges, and I was ordered at an early hour the next morning to send out all the engineers to aid in the same, and to explore the roads. Having retired to the head-quarters camp at Savage's Station, suffering with a violent headache, I was unable to go out in person in the morning. In the course of the day, Captain Duane's battalion, which had been engaged destroying the lower bridges, arrived at the head-quarters camp. I directed him to continue on, by the shortest route he could find, to the vicinity of points of crossing the White Oak Swamp; and myself started by the beaten road to "White Oak Bridge."

I found that Gen. Woodbury had rebuilt the bridge (with the addition of side bridges for infantry or cavalry), and repaired the corduroy road through the swamp, and

that, at a point about a mile and a quarter further up the stream, he had built another bridge. This point, it should be observed, was the site of an old ford ("Brackett's"), to which a road conducted on each side.

In reference to the White Oak Swamp, it may be observed, that the stream itself is quite insignificant, but that, like the Chickahominy, it is bounded by swamp, on each side of which the width is about two hundred yards. The extensive wooded region shown on the Henrico County map on the north of the "Swamp," and usually included in that designation by us, was generally dry and firm, affording good roads.

To make a bridge across the swamp involved, of course, not merely bridging the stream, but the cutting of heavy timber, and the making of a raised corduroy over this 200 yards of swamp. Besides which, unless each bridge had an independent wagon road through the forest, it added little to our facilities, since the moving of our immense wagon trains was the principal difficulty of the problem.

I found the upper bridge I have mentioned pretty well advanced to completion; and Major Magruder, of the 15th New York, in charge of the work, promised it should be done before he left off work that night. I was not satisfied with the approaches, however, and feared that the first few wagons that passed would make them impracticable. I found too that there was, as yet, no established connection or fixed route by which the troops and trains near Savage's Station were to reach this bridge. I started back to make this connection, and met Captain Duane with his battalion. I directed

him to make it his business to keep this bridge and corduroy practicable, and to examine the vicinity to see if there was any other practicable crossing; after which I continued the exploration of the road to connect with the Williamsburg road, near the blacksmith's shop. It was owing to this personal reconnoissance that a connection with the new bridge was established, and troops and wagons put upon this route that night.*

In the evening I ordered Lieutenant-Colonel Alexander to take with him Lieutenants Comstock and Farquhar, and reconnoitre the country in reference to the march and probable new positions of the army. The accompanying extract from his report (marked sub-Report No. 6) will make known his services.

The head-quarters left Savage's Station between 2 and 3 A. M., June 29. I separated from them and proceeded at once to the camp of Captain Duane, following the route I had examined the night before, and over which General Sykes's Division had passed during the night. The road was in good condition, but I found the corduroy over the swamp required constant attention; and recognizing the inutility, or rather impossibility, of constructing for the emergency any other crossing (Captain Duane's officers having been making additional explorations), I directed him to make it his especial business to keep this route practicable. Portions of the wagon-trains and General Heintzelman's Corps passed at this bridge during the day. From this point I proceeded to the "White

* General Heintzelman's Corps reached this bridge by another route; but this would not have answered for other portions of the army, nor for the wagon-trains.

Oak Swamp Bridge," and found the trains and troops rapidly passing. I then rejoined the head-quarters, at the house just beyond (south side of) the swamp. As the passage of the army through or over this "swamp" was one of the difficulties of the march, I deem these particulars worthy of record.

General Keyes's Corps had crossed on the 28th, with orders to take a position to cover our *débouchés* from the swamp and our line of march towards the James River. General Woodbury had been directed to communicate with him and assist him by reconnoissances, and Lieutenant McAlester had been ordered by me to proceed to his positions and make such arrangements there, such as "slashings," obstructing roads, &c., as he could. Colonel Alexander had also, in execution of the duties assigned him, been on this ground, and communicated with the Commanding General concerning it. (See sub-Report No. 6.)

On the morning of the 30th, General Woodbury made a reconnoissance between the Charles City and "Long Bridge" roads, assisting Generals Kearney and McCall in posting their troops, and I went out on all the different roads, arriving at 12 or 1 P. M. at Malvern Hill. At this time the danger seemed (to me) that the "Quaker road," over which our trains were passing, would be taken in flank by the cross-roads, which I had observed to exist from near "Bulten's" or "Warriner's" striking the "Quaker road" near Malvern Hill. (See Campaign Map No. 3.) I did not know what the general arrangement of troops was, nor could I see the Commanding General, who was not on the field; but I mentioned the

circumstance to General Porter, whose troops held the hill. Later in the day, you directed me to post some of the reserve artillery, and I took it to the right and front of Dr. Mellert's house, facing the *débouché* from the woods of the dangerous roads of which I speak, and through which I had previously penetrated to within a half or three-quarters of a mile of the Newcastle road. While I was posting these batteries, General Porter joined me, and established Morell's Division on this line. About this time (perhaps 4 P. M.) the action commenced on the Newcastle road. So near to us was it, that a shell (whether from friend or foe, could not be known) struck near where we were.

Shortly after, the enemy opened upon us with his artillery, from the woods which skirted the bottom-lands to the left or west of Malvern Hill. A brisk cannonade took place, in which we had the better. The gunboats took part in this, and, though there seemed to be indications of force on the Richmond road, our position was found too strong to be assailed from this quarter.

I passed the night at Dew's House (General Porter's head-quarters), where the Commanding General came and remained until 12 or 1 o'clock of the night. The Engineer brigade (a detachment of which had destroyed the "White Oak Swamp" Bridge) and Engineer battalion had proceeded to camp near the head-quarters, Haxall's Landing.

The news of the action on the New Market road had been favorable. Subsequently, and at a late hour, it was reported that McCall's Division had been routed with the loss of its general officers; and, somewhat later,

probably about midnight, it was known that General Franklin was falling back, and that Sumner and Heintzelman were necessarily following his example. This left no latitude of judgment as to the arrangements for the next day. I was ordered to reconnoitre, and assist in putting the troops in position as they came in. I went out early, to get a more general view of the hill and its connections; and afterwards, assisted by Brigadier-General Humphreys (Chief of Topographical Engineers), Colonel Hudson, Captain Mason, and one or two other aides of the Commanding General, I directed the formation of the line.

Leaving the dispositions to be made here by others, I then went to Haxall's, to see how our communications with the James River were to be covered. I found the Commanding General had put Franklin's Corps in position for this purpose. I directed General Woodbury and Captain Duane to make "slashings" on the roads intersecting our long line, which, exceedingly strong at Malvern, was weak elsewhere. In the mean time Brigadier-General Humphreys, with very great labor, had succeeded in running a line through the dense woods of the Turkey Creek bottom, and posting troops so as to connect our left, on Malvern Hill, with our right in front of Haxall's.

A further retreat to Harrison's Landing was ordered for that night (July 1st), it being difficult to keep open our communications with the transports at Malvern. I made a reconnoissance at daylight, July 2d, to form some idea of the position. Entirely ignorant of the locality, having arrived in the darkness of the night, it took some time to get a clear idea of it; a pouring

rain, which commenced soon after sunrise, being unfavorable to distant vision. Finding a broad estuary to the northward I followed it down beyond Westover, to ascertain that there was neither bridge nor ford leading out of it. I then hastened back, to find at the entrance of this *cul-de-sac* a temporary position where our rear-guard could cover its mouth, for the main body of the army was now pouring in. Having done this, I returned to the camp and reported, as speedily as possible, to the Commanding General, who accompanied me in the afternoon to the position, directing General Keyes, whose corps had covered the retreat, to occupy it.

It is in place here to remark that, in moving up from Yorktown to the Chickahominy, the only pontoon equipage which accompanied the march of the army was the train with Captain Duane's command. All the other *matériel* which had been used at Yorktown, or by General Franklin in his disembarkation, was taken up to the White House.

The pontoons of Captain Duane's train were all used in the various bridges on the Chickahominy, and several more (twenty-four, I believe) were brought up from White House:* also a train consisting of thirty Birago trestles and four Russian canvas pontoons.

The pontoons at New Bridge were, with the flooring and other accessories, sunk in the stream, and the "Upper" and "Lower" trestle bridges destroyed. What remained of bridge equipage, say thirty French and two

* On abandoning the White House, the bridge *matériel* remaining there was sent back, I think, to Fort Monroe.

canvas pontoons and ten trestles, was packed and collected on the south side of the Chickahominy by Captain Spaulding (under General Woodbury's orders); but, for want of transportation, part of it was destroyed here and part after crossing the "White Oak Swamp."

About fifteen pontoons (with balks and chess) and a few trestles were brought safely through to Harrison's Landing.

On the retreat from Malvern Hill and Haxall's, a portion of the Engineer brigade was directed to keep the road in order. The crossing of Kimage's Creek (much swollen by the rain), in particular, required incessant labor, during the whole period of the passage of the army and trains, to keep it practicable. One pontoon and four bays of balks and chess were used there, in two bridges, all of which, with the wagons, were afterwards destroyed by our own troops.

On the 3d of July the army commenced moving out to more eligible positions. The brief reconnoissance of the preceding day had shown me that it was necessary to occupy heights on the other side of Herring Creek, and to extend our lines. The Engineer officers were employed this day in assisting in placing the troops in new positions, and in reconnoitring for a defensive line. A very satisfactory one was found, which is tolerably well delineated on the "Campaign Map" No. 3. The left stretched for upwards of a mile along the left bank of Kimage's Creek, which excavated a deep ravine in the table-land through which it flowed, and the lower half of the stream was so deep and marshy as to make an impassable obstacle. In front were cleared fields,

exposed to the fire of our gunboats, while on our own side were woods, which covered our movements and concealed our positions. From near the head of the creek the line turned at right angles, and stretched three-quarters of a mile to the eastward to the "Mill-dam." From a point a half a mile still further to the eastward, on the mill-pond, the line was resumed, ran easterly through the woods about half a mile, and thence southeasterly a mile and a quarter, through the cultivated fields of Westover, and then southerly a half mile, to a point on Herring Creek near Westover church.

It will be seen that of this line, four miles long, that portion on Kimage's Creek was naturally very strong, and, with the aid of the flanking fire of the gunboats, might throughout be considered (with proper defensive arrangements) unassailable; and of that portion of the line parallel to James River, the mill-pond covered nearly a mile of front, so that it could not be assailed; and that the half mile of line constituting our right flank, and the approaches thereto by the Charles City road, were flanked by the fire of our gunboats. The points at which attack was most practicable were where the two roads from the northward came in, one on the left of the mill-pond and one on the right.

Between the mill-pond and the road on the left, a strong redoubt, consisting of two redans connected by a curtain was laid out; thence rifle-pits extended to the mill-dam on the right, barricades extended to the left towards Kimage's Creek, and at the salient angle a redoubt for artillery was designed.

On the right, through the open fields, the line con-

sisted of rifle-pits of strong profile, with two large redoubts or lunettes; one where the road intersected the line and the other at the right salient angle, and both designed to contain a numerous artillery.

Through the woods behind Kimage's Creek and elsewhere, the line consisted of timber barricades covered with earth, with numerous emplacements for artillery, having thick earthen epaulements in front, and *everywhere*, except through the open fields of Westover, the front of these lines was covered by extensive abatis of felled timber.

The works thus described were commenced by the troops themselves as soon as they got into position, who in a single night would cover themselves by quite a respectable obstacle in the shape of a barricade. The redoubts required more time, and though not entirely finished for two or three weeks, they were soon in condition to aid powerfully in the defence. The troops of both the Engineer brigade and Engineer battalion aided in these works.

The general supervision of these works was given by me to Lieutenant-Colonel Alexander, who distributed the immediate supervision between Lieutenants Comstock, McAlester, and Farquhar.

While this work was going on, myself and other of the Engineer officers were engaged in reconnoissances of the river or adjacent country. In company with General Woodbury, I examined very carefully the right bank of the James River, from City Point to the mouth of the Chickahominy, in view of an occupation on our part, and to ascertain the most dangerous points. The

defensive qualities of Coggin's Point were clearly ascertained by me. In company with General Woodbury, Colonel Alexander, Lieutenants Reese, Cross, and Farquhar, I reconnoitred the Peninsula below Charles City Court House, with a view to its eligibility as a defensive position. Subsequently, General Woodbury examined the country from Wilson's wharf across to the Chickahominy, and caused a map of the roads leading from Harrison's Landing to various points on the Chickahominy, to be made by officers of his brigade.

On the 10th of August, Lieutenant Comstock received orders from yourself to make an examination of the Chickahominy at Barrett's Ferry, and roads leading to it; and on his return that night, orders were issued for the construction of a bridge. The *matériel* (which consisted of sixty-one new pontoons and thirty-one old ones) was at Fort Monroe, and it took till the morning of the 12th to get it up to the point mentioned.

At noon of the 13th, the *matériel* was all unloaded, and the bridge commenced at both ends and in the middle: Captain Spaulding, 50th Regiment N. Y. V., being in charge of the western end, Lieutenant Comstock of the middle, and Lieutenant Cross of the eastern end; Captain Duane being in charge of the whole. As the pontoniers had been severely worked during the two preceding days, the work was suspended during the night and resumed in the morning, the bridge being finished at half-past nine A. M. on the 14th, and a squadron of cavalry crossing at ten A. M.

The bridge was 1,980 feet long. The western end was built by "successive pontoons," the rest by "rafts."

At times there was difficulty in manœuvring the rafts, from the depth of the water and the strength of the tidal currents. After its completion it was covered with straw, to prevent the wear of the flooring.

Excepting Heintzelman's Corps, the whole army of the Potomac, with its artillery and baggage-wagons, crossed the bridge. There was no interruption to travel, the accidents being that a few horses got overboard without injury to the bridge. The straw proved a perfect protection to the flooring, scarce a plank being found injured.

The advanced guard of General Porter passed on the morning of Friday, the 15th, and at ten A. M., August 18th, the extreme rear-guard had passed; and at half-past two P. M. the boats were all out of the bridge, and at three P. M. all the bridge *matériel* was in tow of steamers bound for Old Point. Besides the officers already mentioned, Captain Duane was assisted by Lieutenant Reese.

On Friday, the 15th, I left Harrison's Landing by steamer for Fort Monroe, under orders from the Commanding General; and on the 16th I received a telegram from the head-quarters at Washington, relieving me from duty with the Army of the Potomac.

Some allusion to the services of officers and troops during the campaign is called for from me, in such a report as this.

The account here given, and in the report of the siege of Yorktown, and the various sub-reports which accompany this, will give a pretty clear idea of the amount and character of their services.

In Brigadier-General D. P. Woodbury I found an able and zealous coadjutor. The duties of his brigade did not give him a prominent part in the actual siege-works of Yorktown (the battery No. 4, of 13-inch mortars, being the only one laid out and superintended by him), but in the construction of the numerous bridges and roads, and in the making of gabions and fascines, the services of himself and brigade were arduous and important; and from Lieutenants Hassler and Farrell I received valuable assistance in reconnoitring the works.

The sub-Report No. 2 gives a fair idea of the services of the brigade, as connected with the marches of the army and the sub-Report No. 1 shows that a portion of the brigade, under Colonel Murphy, rendered valuable services in the preparations for the landing of General Franklin's division, and in executing the same. On the Chickahominy, and on the retreat to the James, the duties of the brigade were arduous (as have been described), and I found in its chief, throughout the campaign, an officer prompt and fertile in expedients, daring and assiduous in execution, and always exhibiting a wise foresight.

The following officers of the Volunteer Engineer Brigade have been mentioned to me by their commander as particularly deserving of notice:

Lieutenant-Colonel W. H. Pettes, 50th N. Y., for constant and efficient attention to his duties.

Captain (now Major) Ira Spaulding, 50th N. Y., for unremitting and successful work in the construction of military bridges.

Captain O. E. Hine, 50th N. Y., for habitual good con-

duct, and for maintaining bottom bridges under difficult circumstances.

Captains Beers, Ford, and Brainerd, for untiring energy and fidelity.

Major (now Lieutenant-Colonel) James A. Magruder, 15th N. Y., for energy and perseverance.

Captain (now Major) E. C. Perry, for energy and perseverance.

Captain W. A. Ketchum, 15th N. Y., for energy and hard work in the construction of roads and bridges.

Lieutenant (now Captain) H. V. Slosson, 15th N. Y., for good conduct throughout the campaign.

Lieutenant T. M. Farrell, 15th N. Y., for skill and perseverance.

Lieutenant F. R. Hassler, A. D. C., 15th N. Y., for constant energy and intelligence in the performance of his duties.

Captain H. W. Bowers, Assistant Adjutant-General, for intelligence and perseverance in the discharge of his laborious duties.

Lieutenant C. S. Webster, 15th N. Y., died of disease contracted on the Chickahominy.

Lieutenant H. C. Yates, 50th N. Y., died from disease contracted in the trenches at Yorktown.

The services of Lieutenant-Colonel Alexander are so frequently alluded to, besides being exhibited in his own reports (see sub-Reports Nos. 1 and 6), that it is hardly necessary to say that he sustained, as a military engineer in the field, the high professional character which he had previously acquired.

Captain C. S. Stewart rendered valuable services at

Yorktown, and at the battle of Williamsburg he discovered the unoccupied works on the enemy's left, ascertained the existence of and reconnoitred the route by which they might be gained, and by which Lieutenant Farquhar (who has accompanied him), led Hancock's Brigade. To him, therefore, the decided successes on that part of the field are in a great measure due. Afterwards, with the advanced guard under General Stoneman, he was so unsparing of himself, in his reconnoissances and reports of the character of the country, roads, &c., as to induce the sickness which compelled him to leave the field.

If I should have to mention any single individual as distinguished above any other in the army for unceasing toil and unsparing devotion, it would be Captain J. C. Duane. In the trenches at Yorktown, in the dangerous and laborious works in the swamps and floods of the Chickahominy, he seemed to know no fatigue and to allow himself no repose. The pontoon bridge built by him over the lower Chickahominy was one of the most extensive known to military history.

Lieutenants C. B. Comstock and M. D. McAlester rendered most gallant and valuable services in the siege-works of Yorktown, and the latter had again an opportunity, at the battle of Williamsburg, of exhibiting his gallantry, and rendering important aid to his Commanding General. On reaching the Chickahominy, these two officers were with me at the first armed reconnoissance of Bottom's Bridge, and the works for the *tête-de-pont* were laid out and executed by them. Lieutenant Comstock accompanied the advance, under General Keyes,

until it took its first position near Savage's Station. While the other engineer officers were mainly confined to specific works, a larger part of the duty of reconnoissances, particularly on the right bank of the Chickahominy, fell on these two, and under their immediate supervision the works described on that side were built, as subsequently, at Harrison's Landing, they had charge of considerable portions of those lines. They both exhibited unwearied assiduity and great gallantry.

Lieutenant W. E. Merrill has been mentioned as having been severely wounded on the 16th of April, in an attack upon a portion of the enemy's lines near Yorktown. He has been already brevetted for gallant conduct on that occasion.

Lieutenants Reese, Cross, and Babcock commanded the three companies constituting the Engineer battalion under Captain J. C. Duane; and, though sometimes available for general reconnoissances, their duties were usually with their commands.

They vied with their chief in their unwearied assiduity and in their gallantry. Upon them, as upon their immediate chief, devolved much of the most exposed service, in the laying out and executing the trenches and batteries before Yorktown.

An instance of great gallantry and magnanimity on the part of Lieutenant Babcock has been mentioned by me as occurring in my presence at the "New Bridge," on the morning of June 1st. On the Chickahominy, and subsequently, their duties in the construction of bridges, batteries, &c., were arduous and exposed.

2d Lieutenant F. U. Farquhar rendered valuable ser-

vices at the siege of Yorktown. He was one of the three engineer officers present at the battle of Williamsburg, accompanied Captain Stewart in his reconnoissances which discovered the enemy's unoccupied redoubts, and led General Hancock's brigade thereto. He was sent back to the Commanding General in the evening with the colors captured. With the advanced guard of General Stoneman, and subsequently in the various engineer works and duties on the right bank of the Chickahominy, he was daring and indefatigable.

1st Lieutenant (now Captain) H. L. Abbot, Topographical Engineers, was attached to my person throughout the campaign as an aide. His services were particularly noticeable during the siege of Yorktown, by his valuable reconnoissances, and by his skill in combining the information gained by others into maps of the works, and of the topography of the ground. During the march to the Chickahominy, and while the army was encamped on the river, his time was principally occupied in making up the map of the country, founded on the reconnoissances of the officers of both Engineer corps and others, in which duty he was under the immediate direction of Brigadier-General Humphreys. His health, which had suffered from the miasma of the Potomac, while serving on the defences of Washington, was further impaired at Yorktown and on the Chickahominy, and he was unable to bear much physical labor or exposure. After reaching the James River he was compelled to leave the army by an illness which prostrated him for two months, during which time however he superintended the preparation of the "Campaign Maps."

1st Lieutenant N. I. Hall, 5th Artillery (now Colonel of the 7th Michigan volunteers), was assigned to duty with me as Adjutant before Yorktown, and accompanied me in that capacity. Besides his services in this capacity, he executed valuable reconnoissances both at Yorktown and on the Chickahominy.

During the march of the army to the James River he was employed by yourself, as bearer of despatches, &c., between the different corps.

I have enumerated twelve officers of the Engineer corps (including Lieutenant Abbot, T. E.); of these, one possessed the rank of Brigadier-General of Volunteers, another of Lieutenant-Colonel A. D. C. (the first is a Major, the second a Captain in the corps), and two were Captains, seven others 1st Lieutenants, and one a 2d Lieutenant. The Brigadier-General was so made expressly to enable him to command the brigade of volunteer regiments. The battalion of regular engineers was commanded by a Captain, and each of its three companies by a *single* 1st Lieutenant.

It will be thus seen that the Corps of Engineers, as now organized, does not furnish adequate rank even to command the limited number of engineer troops brought into the field.

The engineers attached to the army corps (with the single exception of Lieutenant-Colonel Alexander, who derived his rank, not from the corps, but from a law having no particular relation to engineers, and since repealed) were but *Lieutenants*. In a European service the Chief Engineer serving with an army corps would be a field officer, generally a Colonel. (See note, p. 69.)

There is a twofold evil in this want of rank; *first*, the great hardships and injustice to the officers themselves, for they have, almost without exception, refused or *been* refused high positions in the volunteer service (to which they have seen their contemporaries of the other branches elevated), on the ground that their services as *engineers* were absolutely necessary.

Second. It is an evil to the service, since an adequate rank is almost as necessary to an officer, for the efficient discharge of his duties, as professional knowledge. The engineer's duty is a responsible one. He is called upon to decide important questions; to fix the position of defensive works (and, thereby, of the *troops* who occupy them); to indicate the manner and points of attack of fortified positions. To give him the proper weight with those with whom he is associated he should have, as *they* have, adequate rank.

The campaign on the Peninsula called for great labor on the part of the engineers. The country, notwithstanding its early settlement, was a *terra incognita*. We knew the York River, and the James River, and we had heard of the Chickahominy; and this was about the extent of our knowledge. Our maps were so incorrect that they were found to be worthless before we reached Yorktown. New ones had to be prepared, based on reconnoissances made by the officers of engineers.

The siege of Yorktown involved great responsibility, besides exposure and toil. The movements of the whole army were determined by the engineers. The Chickahominy again arrested us; where, if possible, the responsibility and labor of the engineer officers were in-

creased. In fact, everywhere, and on every occasion, even to our last position at Harrison's Landing, this responsibility and labor on the part of the engineers was incessant.

I have stated above in what manner the officers of engineers performed their duties. Yet thus far their services are ignored and unrecognized, while distinctions have been bestowed upon those who have had the good fortune to command troops. Under such circumstances, it can hardly be expected that the few engineer officers yet remaining will willingly continue their services in this unrequited branch of the military profession. We have no sufficient officers of engineers at this time with any of our armies to commence another siege, nor can they be obtained. In another war, if their services are thus neglected in this, we shall have none.

Another evil of no inconsiderable magnitude was experienced in this campaign, growing out of the want of a properly organized engineer service in this country. In a European service every "*corps d'armée*" (or division, if this were the highest unit of command) would have its proper proportion of engineer troops, and to their charge would be committed the engineer train, carrying the intrenching tools for the use of the troops. For example, a corps of thirty or forty thousand men would have, in the French service, a train of forty-one wagons, of which thirty would carry 10,000 intrenching tools. This train would be under the immediate charge of a company of sappers, whose business it would be to issue them to the troops where wanted, to be with the

working parties, directing the same, and to receive the tools back again when the work was completed.

For want of such an organization the issue of intrenching tools to the army was necessarily left to the Quartermaster's Department. This department, burdened with its immense duties, could not give especial attention to this; in consequence of which, important works were frequently delayed, as at Yorktown, where details assembled to make roads were sent back for want of tools, though they were in ample quantities on board the transports.

Furthermore, it was impossible to maintain any system of responsibility for the tools. The soldier found an axe or a shovel a very convenient thing to have at his camp, and carried one off with him. When the army moved he found it inconvenient to carry, and threw it away. Thus, notwithstanding the number of tools issued to the army at Yorktown and on the Chickahominy, we were almost wholly dependent, in making the works at Harrison's Landing, upon new supplies from the transports sent to the James River.

The pontoon equipage which accompanied the army was got up (as already mentioned) by Lieut.-Col. Alexander, assisted by Capt. J. C. Duane. The former had acquired an enviable reputation as the builder of the Minot's Ledge Light-House; possessed great practical ingenuity, and had had the means of knowing the best results arrived at in other services in this branch of military art.

Captain Duane possessed a more extensive and thorough practical and experimental knowledge of military bridges than any other man in this country.

They gave, after full consideration of the subject, their preference to the French system. Even had they adopted this system blindly, *because* it was French, they would not have been without solid reasons, for the French have studied and *experimented* upon the best systems known to the world. Whatever may be said about the difference in the character of the country, roads, etc., the thing *to be done* here and in Europe (now that our armies have assumed European magnitude) is essentially *the same*.

But these officers had before them the best *modern inventions* of Europe and America. The India-rubber pontoon they knew *thoroughly*; corrugated iron bodies, and countless other "inventions" of American genius, were before them, and the former experimented upon.

My own prepossessions had been in favor of the Birago system of sectional pontoons, and "Birago" (so called) trestles.

The experience we had, proved the wisdom which adopted the system in question. Not to advance, by any means, that nothing better can be found (the substitution of iron for wood was one of the probable improvements well understood by the officers named, but not, *at the time*, adopted, for substantial reasons), it is enough to say that the French pontoon was found to be most excellent, useful, and reliable for *all* military purposes. They were used by the Quartermaster's Department in discharging transports; were precisely what was needed for the disembarkation of General Franklin's division; constituted a portion of the numerous bridges built over Wormley Creek during the siege of Yorktown, and were of the highest use on the Chickahominy, while

over the lower Chickahominy, some 75,000 men, some 300 pieces of artillery, and the immense baggage-trains of the army, passed over a bridge of the extraordinary length of nearly 650 yards; a feat scarcely surpassed in military history.

The Birago trestle, of which I had formed so high an opinion, proved itself dangerous and unreliable; useful for an advanced guard or detachment, unfit, in general, for a military bridge. Of the American India-rubber and the Russian canvas pontoon we had no fair experiment. They may both be useful; but again, I think, not reliable for a "military bridge," considered in all its aspects and uses.

The weight of the French pontoons is objected to, but *a certain flotation power is required* which it is not easy to get, nor are the ways unobjectionable which seek to get it with less weight; and the vehicle which carries it is not heavier loaded than other vehicles of an army train. *Less length* would certainly make it more manageable on our narrow roads, while, for advanced guards and dashing minor enterprises, greater lightness is requisite. Perhaps an iron sectional pontoon may be contrived which will meet these requirements, but prudence demands that the safety of an army shall not be jeopardized by giving it a bridge which experiment has not fully tested. American genius is fertile in this as in all other expedients, but no genius can provide for an object which is not understood.

The numerous proposers of "flying" bridges forget that, if a military bridge is intended to be *carried with* an army, it is also intended to *carry* an army, its col-

umns of men, its cavalry, its countless heavy wagons, and its ponderous artillery. It must carry all these, and it must do it with certainty and safety, even though a demoralized corps should rush upon it in throngs.

No make-shift expedient, no "ingenious" inventions, not tested by severe experiment, nor light affair, of which the chief merit alleged is that it is light, will be likely to do what is required, and what the French pontoon has so often done.

Here, perhaps, I might close; but it occurs to me that this paper, purporting to give a history of the operations of the Engineers, from the organization of the Army of the Potomac to the close of its campaign on the Peninsula, can hardly be considered complete without a retrospect pointing out the mistakes that were made, and thus tracing the causes of its failure to their true sources.

One of the prominent among the causes of ultimate failure was the inaction of eight months, from August, 1861, to April, 1862. More than any other wars, rebellion demands rapid measures. In November, 1861, the Army of the Potomac, if not fully supplied with all the *matériel*, yet was about as complete in numbers, discipline, and organization as it ever became. For four months the great marine avenue to the Capital of the nation was blockaded, and that Capital kept in a partial state of siege, by a greatly inferior enemy, in face of a movable army of 150,000 men. In the winter of 1861-'62, Norfolk could and should have been taken. The navy demanded it, the country demanded it, and the means were ample. By its capture, the career of the Merrimac, which proved so disastrous to our subsequent

operations, would have been prevented. The preparation of this vessel was known, and the Navy Department was not without forebodings of the mischief it would do.

Though delay might mature more comprehensive plans, and promise greater results, it is not the first case in which it had been shown that successful war involves something more than abstract military principles. The true question was to seize the first practicable moment to satisfy the (perhaps unreasonable, but) natural longing of an impatient nation for results to justify its lavish confidence, and to take advantage of an undivided command, and untrammelled liberty of action while it was possessed.

When the army did move, a plan was adopted perfectly certain to invite, nay, to *compel* interference; and when the army was to go by Annapolis to the lower Chesapeake, I felt confident that one-half would scarcely have embarked before the other half would be ordered back to Washington. The enemy was then at Manassas, and the feint (even if no reality) of an attack on Washington was so obvious, so certain to create a panic which no executive could resist, that interference with the removal of the mass of the army was certain.

When the enemy had fallen back behind the Rappahannock, and destroyed the railroad bridges, the circumstances were greatly changed, and there were strong arguments for the line adopted; yet results have proved how many reasons there were to be considered besides the purely military ones, which opposed themselves to the adoption of such a line. The facts connected with

the withholding of McDowell's corps have been so completely exhibited in the proceedings of the McDowell Court of Inquiry, that every one who wishes can form his own judgment. Whether it was wise or unwise, it was one of those things resulting from the taking a line of operations which did not itself cover Washington.

At the time the Army of the Potomac landed on the Peninsula, the rebel cause was at its lowest ebb. Its armies were demoralized by the defeats of Port Poyal, Mill Spring, Fort Henry, Fort Donelson, Roanoke Island, Pea Ridge, and reduced in numbers by sickness, loss in battle, expiration of period of service, &c.; while the conscription law was not yet even passed. It seemed as if it needed but one vigorous gripe to end for ever this rebellion, so nearly throttled. How then happened it that the date of the initiation of the campaign of this magnificent Army of the Potomac was the date of the resuscitation of the rebel cause, which seemed to grow strong *pari passu* with the slow progress of its operations?

However I may be committed to any expression of professional opinion to the contrary (I certainly did suggest it), my opinion now is, that the lines of Yorktown should have been assaulted. There is reason to believe that they were not held by strong force when our army appeared before them, and we know that they were far from complete. The prestige of power, the *morale*, was on our side. It was due to ourselves to confirm and sustain it. We should probably have succeeded, and, if we failed, it may well be doubted whether the shock of an unsuccessful assault would have been

more demoralizing than the labors of the siege. Our troops toiled a month in the trenches, or lay in the swamps of the Warwick. We lost few men by the siege, but disease took a fearful hold of the army, and toil and hardship, unredeemed by the excitement of combat, impaired the "morale." We did not carry with us from Yorktown so good an army as we took there. Of the bitter fruits of that month gained by the enemy, we have tasted to our hearts' content: they are not yet exhausted.

The siege having been determined upon, we should have opened our batteries on the place as fast as they were completed. The effect on the troops would have been inspiring. It would have lightened the siege and shortened our labors; and besides, we would have had the credit of driving the enemy from Yorktown by force of arms, whereas, as it was, we only induced him to evacuate for prudential considerations. Yorktown having fallen, however, as it did, it was right to pursue the enemy with our whole force; but the battle of Williamsburg, fought as it was without reconnoitring the position, without concert of action among the different corps and division commanders, and almost without orders, was a blunder which ought not to have happened.

We knew of this position beforehand, and we know it was fortified. We might have been sure, if the enemy made a stand there, that it would be a strong one, for he would be fighting for time to get his trains out of our reach. We fought, and we lost several thousand men, and we gained nothing. If we had not fought till next day, a battle would in all probability have been

unnecessary ; but if it had been, we could have had time to have brought up our resources, reconnoitred our position, and delivered our attack in such a way that some results might have flowed from it. We had every advantage ; Franklin's division landed at West Point on the next day, and Sedgwick's division on the day following. These two divisions, had the enemy waited another day at Williamsburg, could have cut his communications, and in that case we would have been superior in his front, and have had two divisions in his rear. His hasty retreat, and perhaps his capture, must inevitably have followed, and the great object of keeping Franklin so long embarked, and finally sending him to West Point, would have been accomplished.

On leaving Williamsburg, we should have crossed the Chickahominy and connected with the navy in the James. We should have had a united army, and the co-operation of the navy, and probably would have been in Richmond in two weeks. The facts that we did not know the character of the Chickahominy as an obstacle (as it lay across our direct road to Richmond); that our transports were on the York river, and that the railroad furnished a good means of supply to the army; that we wished to connect with McDowell coming from Fredericksburg, &c., determined our route. In taking it, we lost, essentially, all that was worth going so far to gain, viz. : the James river approach, and the co-operation of the navy.

The route chosen, two weeks should not have been spent in traversing the forty miles from Williamsburg to Bottom's and New Bridge ; and, the barrier of the

Chickahominy being left unguarded at Bottom's Bridge, no time should have been lost in making use of the circumstance to turn and seize the passage of New Bridge (which might have been done by the 28th, and even earlier, had measures been pressed for taking it).

The repulse of the rebels at Fair Oaks should have been taken advantage of. It was one of those "occasions" which, if not seized, do not repeat themselves. We now *know* the state of disorganization and dismay in which the rebel army retreated. We now *know* that it could have been followed into Richmond. Had it been so, there would have been no resistance to overcome to bring over our right wing. Although we did not then know all that we now do, it was obvious enough at that time, that when the rebels struck a blow at our left wing, they did not leave any means in their hands unused to secure success. It was obvious enough that they struck with their *whole* force; and yet we repulsed them in disorder with three-fifths of ours. We could have followed them up at the same time that we brought over the other two-fifths.

After it was known that McDowell was called off to another quarter, there was no longer hope of an increase of force by the junction of his corps. There were no other reinforcements to look for beyond what we received by the middle of the month of June. The rebel force was known, or supposed, to be constantly increasing by conscription, by the influx of troops from other parts, and by the breaking up of Beauregard's army.

At last a moment came when action was imperative. The enemy assumed the initiative, and we had warning

of when and where he was to strike. Had Porter been withdrawn the night of the 26th, our army would have been *concentrated* on the right bank, while two corps at least of the enemy's force were on the *left* bank. Whatever course we then took, whether to strike at Richmond and the portion of the enemy on the right bank, or move at once for the James, we would have had a concentrated army, and a fair chance of a brilliant result in the first place; and in the second, if we accomplished nothing, we would have been in the same case on the morning of the 27th as we were on that of the 28th—*minus* a lost battle and a compulsory retreat; or, had the fortified lines (thrown up *expressly* for the object) been held by 20,000 men (as they could have been), we could have fought on the other side with 80,000 men instead of 27,000; or, finally, had the lines been abandoned with our hold on the right bank of the Chickahominy, we might have fought and crushed the enemy on the left bank, reopened our communications, and then returned and taken Richmond.

As it was, the enemy fought with his *whole force* (except enough left before our lines to keep up an appearance), and we fought with 27,000 men, losing the battle and 9,000 men.

By this defeat we were driven from our position, our advance of conquest turned into a retreat for safety, by a force probably not greatly superior to our own.

In view of the length of time which our operations before Richmond actually consumed, there is now no doubt that the *dépôt* at the White House should have been fortified, as well as *one* or two points on the railroad

thence to the Chickahominy; that the *tête-de-pont* at Bottom's Bridge should have been completed, and likewise *têtes-de-pont*, or strong positions, prepared to cover the *débouchés* from our bridges to the left bank of the Chickahominy. With these the army would have possessed freedom of motion and concentration on either side, and the disastrous battle of the 27th would scarcely have occurred.

When the army reached the James river, it needed no prophet to predict the disasters which have since befallen our country's cause. If the army had sustained itself nobly, it cannot be denied that so much fruitless toil and so much disaster had deprived it of the "*élan*" which results from success alone. It was, moreover (as well as our forces elsewhere), sadly diminished in numbers. On the other hand, the rebel army, from its first low state, had risen to be an army most formidable in numbers, excellent in organization, and inspired by a great success. Had its numbers, indeed, approached to that attributed to it (200,000 men), there is little doubt that a march upon Washington would have speedily followed our withdrawal to the James. From such considerations, as well as those flowing from the results of past operations, I counselled the immediate withdrawal from the James, to reunite with the forces covering Washington.

The following documents accompany this report:

SUB-REPORT No. 1.—Report of Lieutenant-Colonel B. S. Alexander. Engineer operations connected with the disembarking of the division of Brigadier-General W. B. Franklin.

SUB-REPORT No. 2.—Report of Brigadier-General D. P. Woodbury. Operations of Engineer Brigade, from May 21st to May 29th.

SUB-REPORT No. 3.—Report of Captain J. Spaulding, 15th N. Y. S. V., concerning the construction of the "Upper Trestle Bridge," on the night of May 31st, &c.

SUB-REPORT No. 4.—Report of Captain W. Brainerd, 50th N. Y. S. V., concerning operations at the "Lower Trestle Bridge," on the night of May 31st, &c.

SUB-REPORT No. 5.—Report of Captain W. A. Ketchum, concerning the construction of the "Lower Trestle Bridge" during the day of June 1st.

SUB-REPORT No. 6.—Extract from personal report of Lieutenant-Colonel B. S. Alexander.

Respectfully submitted,

(Signed) J. G. BARNARD, *Brig.-Gen.,*
and Chief Engineer Defences of Washington.

APPENDIX.

THE following officers of Artillery were detailed temporarily for Engineer duty during the siege of Yorktown, and rendered very valuable services in the execution of the siege-works, viz. :

1st Lieutenant	A. C. M. PENNINGTON,	2d Artillery.
"	"	JOHN M. WILSON, " "
"	"	S. N. BENJAMIN, " "
"	"	P. C. HAINS, " "
"	"	W. D. FULLER, 3d "
"	"	G. W. DRESSER, 4th "
"	"	A. AMES, 5th "
"	"	C. E. HAZLETT, " "

NOTE TO PAGE 54.

It is stated that "in an European service the Chief Engineer serving with army corps would be a field officer—generally a colonel."

It would be more proper to say, that the Chief Engineer of an army corps would be a general officer. The following is from Laisné (*Aide-Mémoire Portatif du Génie*) :

"The Engineer Staff of an army is composed as follows :—

"A general officer, Chief of Engineers; a general or field officer of Engineers, Chief of Staff; a field officer of Engineers, Director of the Park; and field officers, inferior officers, non-commissioned officers of Engineers, in greater or less numbers, according to the presumed needs of the service.

"There is habitually attached to each division of Infantry a Chief of Engineers, of the grade at least of captain of the first class.

"If an army corps is formed to act independently, there is attached to it a Chief of Engineers, who may be only a field officer; a Chief of Staff and a Chief of the Park, who may be only captains.

"Officers of Engineers of all grades, who are not serving with Engineer troops, constitute a part of the Staff of the army, the army corps, or of the division in which they are employed."

According to Duparcq (Elements of Military Art and History, by E. de la Barre Duparcq—translated by Brig.-Gen. G. W. Cullum, Lieut.-Col. of Engineers, &c.): "In each army, and in each *corps d'armée*, a general officer commands the Artillery, and another general officer com-

mands the Engineers. Each has under his orders a certain number of officers of his arm—among others, a colonel or lieutenant-colonel, chief of staff of the arm, and a superior (field) officer as director of the park, together with the number of guards and employés indicated by the wants of the service.”

The Chief of Engineers of the French army before Sebastopol (as organized September 8th, 1855), Niel, was a general of division (corresponding to our major-general), having a colonel of Engineers as chief of his staff.

The Chief of Engineers of the first *corps d'armée* was a general of division; those of the second and “reserve” *corps* were brigadier-generals. A lieutenant-colonel of Engineers was Chief of Staff to the Chief Engineer of each corps. Most of the “divisions” had field officers of Engineers attached to them as chiefs of their arm of service.

SUB-REPORT NO. 1.

REPORT OF LIEUT.-COL. B. S. ALEXANDER.

WASHINGTON, *January 28th*, 1863.

Brigadier-General J. G. BARNARD,

Late Chief Engineer Army of the Potomac :

SIR :—In compliance with your request, I proceed to give you a sketch of the operations upon which I was engaged during the time I was detached from your command while the army was before Yorktown, until I again joined you at Cumberland, on the Pamunkey River.

On the 20th of April, 1862, the army then being actively engaged in prosecuting the siege of Yorktown, I was directed by General McClellan to join General Franklin as the Engineer of his division, which had then arrived at Cheesman's Landing.

I had previously understood from the General that it was his intention, at the proper time, to throw General Franklin's Division across to the north side of the York River, some three or four miles below Gloucester Point, and endeavor to seize the works there, or at least to turn them, and thus distract the attention of the enemy while the main assault should be made at Yorktown.

A few days afterwards, General McClellan, General Franklin, Captain Rogers, of the Navy, and myself, proceeded to reconnoitre the shore on the north side of the

York River, and select as near as possible the exact spot where the proposed landing should be effected. This point being settled, I had some soundings taken, to ascertain how near our transports could be taken to the shore, the depth of water, and nature of the bottom over the intervening space. I found that we could take vessels drawing eight feet of water to within a certain distance, I think about 800 feet, of high-water mark; that the bottom from this point to the shore was a very regular slope of sand, over which infantry could march when we should reach to within 250 feet of the shore, or to where the water was not over 2 feet 6 inches deep.

This sand, however, was like that on the south shore of the river, and was of such a nature that I supposed it would not be prudent to trust artillery upon it, as there would have been danger of the carriages settling to their axle-trees.

As soon as this information was obtained, I set about preparing the means to effect a rapid landing, when it should be ordered.

Colonel John McLeod Murphy, with a detachment of 250 men of the New York 15th regiment of Volunteer Engineers, was detailed to assist in these preparations.

Many schemes were proposed, which were thoroughly discussed by General Franklin, Captain Rogers, of the Navy, Captain Arnold, of the Artillery, and myself.

As the plan which I finally decided to adopt was afterwards successfully carried out at West Point, it may be proper to describe it here.

In general terms it was this:

We had a number (10 or 12) of canal-barges, boats say 14 feet wide and 70 to 80 feet long, drawing, when loaded, 5 feet of water, when light 2 feet, of about 80 tons burden. We also succeeded in picking up some (4) scows, flat-boats, say 12 feet wide and from 40 to 60 feet long.

We also had (say 70) pontoon-boats, with balks, chess, oars, anchors, &c., in fact, every thing necessary to make a pontoon bridge, say 1400 feet long.

In addition, we had all the lumber we wanted ; for precaution had been taken to load the canal-barges with lumber of various dimensions before they left Washington. We also had cordage, and an abundant supply of tools.

By lashing two of the canal-barges together, placing the boats some 12 feet apart, and throwing a false or additional deck over the whole, we had an area some 40 feet wide and 45 feet long, upon which a whole battery of artillery could be placed. This boat, when so loaded, would draw only about four (4) feet of water.

Two more canal-barges, fixed in the same manner, would carry the horses of a battery, or at least enough of them to move the pieces and caissons, leaving the remainder to follow afterwards.

Several of these double boats—four, I think—were thus prepared, and the men were drilled for two or three days in taking them as near to the shore as they would float, and then making a bridge from there to the shore. When this bridge was completed, the artillerymen were drilled in bringing on their artillery and horses, and afterwards in taking them off.

As the shore on the south side of Cheesman's Creek

was similar to that where it was proposed to land, this experience proved that we could land artillery very rapidly in this way; and when it was landed each double canal-boat became a "wharf-head," alongside of which our light-draught vessels could discharge their cargoes. Four of them would consequently give us four wharves as soon as the artillery was discharged.

I also prepared several rafts of pontoon-boats, each raft being made with two boats, in the usual manner, except that the number of balks was doubled. Each of these rafts would carry one piece of artillery very conveniently, and as they did not, when so loaded, draw more than nine inches of water, it was intended when they grounded to draw the pieces on shore by hand, putting about 200 men to each piece.

Instead of drilling the men in the use of these rafts, they were *permitted* to use them for two or three days, in landing both men and horses from the transports in Cheesman's Creek. It was noticed that they soon became quite expert in handling them, and that they would carry 80 or 90 men with ease. Horses were also landed from them with considerable facility.

These double canal-boats and rafts, with the necessary ground-tackle and gang-planks, completed the arrangements for landing the artillery.

As it is frequently overlooked, it may be proper to state precisely what gang-planks are required under such circumstances. We prepared the following:

Four gang-planks, built so that a carriage or any thing else could be taken from the deck of a vessel up to the gunwale.

Four, about 20 feet long, reaching thence to the canal-barges.

Four more, about 30 feet long, reaching thence to the flat-boats.

Four more, about 14 feet long, reaching thence to the pontoon bridges or rafts.

Four more, about 12 feet long, reaching thence to the shore.

All these gang-planks were made 10 feet wide, and very strong; ropes were fastened to their corners, and the larger ones were placed on rollers.

For landing the infantry, it was designed to use the pontoon-boats. Each boat, besides the three men to manage it, will carry 40 men, with their arms and knapsacks, very conveniently.

When a landing was to be effected, it was designed to move the fleet of transports from Cheesman's landing to the York River, and immediately load about 50 boats with, say, 2,000 men, and let the boats at a given signal pull for the shore; the men manning the boats would then pull back for another load. The only preparations that it was necessary to make, in reference to this operation, was to provide proper facilities to enable the men to get from the transports into the pontoon-boats.

It was at first proposed to leave this matter to the captains of the vessels, letting each captain provide the means of getting the men from his vessel into the boats. But our experience at Cheesman's Creek soon showed that this would not do, should haste become necessary.

It was observed, when a vessel containing several

hundred men would get permission to land the men for a day, that the men had to climb down the sides of the vessel one by one, and that one man would not start until the man before him was in the pontoon-boat. In this way it was found that fully half a day would be consumed in landing the men from some of the larger transports, although they had plenty of boats to carry them at one trip, and they could have been landed in an hour, if proper facilities for getting from the vessel into the boats had been provided.

I deemed it proper, therefore, to make a number of gang-planks, so that the men could walk (in single file) from the deck of the vessel up to the gunwale on either side, and down the sides, by an easy slope, to the boats; the exterior gang-planks being supported from the vessels, and extending down into the water, and *not* resting on the boats, but being entirely independent of them. Two planks of the proper length, each one foot wide and $1\frac{1}{2}$ inches thick, laid side by side, and battened together on both sides, with strips of boards about three inches wide and $1\frac{1}{2}$ inches thick, were found to be very convenient for this purpose.

All these preparations were about completed, and we were engaged in making scaling-ladders, thinking we might be called upon to assault the works at Gloucester Point, when suddenly, on the morning of May 4th, the news spread through the fleet that the enemy had evacuated Yorktown.

Orders were received during the day by General Franklin to take his command around to Yorktown, and prepare to proceed with it up the York River.

The next morning found most of the fleet at Yorktown, all the preparations we had made for landing accompanying it.

This was the day of the battle of Williamsburg. During the forenoon General McClellan came over to Yorktown, and held a consultation with General Franklin. It was decided that he should proceed with his command at once to West Point, at the head of the York River, and try and effect a landing on the right bank of that river, just below the mouth of the Pamunkey River. All the information we could obtain on the subject, led us to believe that "Brick-house Point" offered the greatest advantages for this purpose.

A delay in the arrival of some of the transports prevented our leaving Yorktown during Monday, and it is probable that the generals decided that it was not wise to move from that place until the result of the battle then going on at Williamsburg should be known.

However this may be, orders were received from General McClellan, late in the evening, to proceed at once up the river; but it was then dark, and it was found impossible to communicate the proper orders for such a movement at night. Besides, one or two of the large transports had run aground during the day, and, as we were deficient in river-pilots, it was feared there would be danger of many more of them getting aground during a movement at night. In fact, the officers of the gunboats refused to convoy the fleet during the night, so General Franklin was forced to postpone the movement till morning.

Soon after daylight, on the morning of the 6th, we got under way. It was a clear day with a high wind.

Nothing that was not foreseen happened on the voyage up the river. It may be mentioned, however, that the fleet was much scattered, and that some of the pontoons which were towed by the steamers broke loose, causing considerable delay.

About 12 o'clock, however, the vessels began to arrive at their destination. One or two small boats were sent in close to shore, to select the exact spot where we should land, and take the necessary soundings. The water was found to be shoal for some considerable distance from the shore, and altogether the landing-place was not unlike that for which preparation had been made below Gloucester.

This being ascertained, the gunboats took up positions so that they could bring a cross-fire to bear on the enemy, should the landing be opposed.

It may be remarked, that the spot selected for the landing was a large, level plateau, only a few feet above the level of the river, and cleared for about a mile from the landing-place. The only opposition that could have been made to the landing would have been from artillery, which might possibly be concealed in the wooded heights beyond. We knew that no troops, in any force, would show themselves on the open plateau, so directly under the fire of the gunboats.

About four o'clock in the afternoon, every thing being in readiness, the artillery beginning to arrive, and the tide suiting, orders were given to land the troops.

About fifty pontoon-boats, manned at first by the

detachment of the 15th N. Y. Regiment, moved to the transports containing the troops that were first to land.

And now the preparation we had made came into play. In less than an hour the boats were loaded, and at a given signal they all pulled for the shore, carrying some 2,000 men, besides the oarsmen.

As soon as the boats grounded, the men jumped out and waded ashore, forming at once in line of battle.

The oarsmen returned at once with the boats, and continued afterwards to land the troops as rapidly as possible, but without order, or "at will," so to speak; for after the first trip, each boat went about its work independently of the others. Care was taken, however, to confine the boats as much as possible to one brigade until it was all landed, before the landing of another brigade was commenced.

In three hours the main body of the infantry, say 8,000 men, were on shore formed in order of battle, with pickets thrown out into the woods beyond the open plateau.

The men carried their knapsacks and haversacks. The pontoon rafts were used by the officers to land their horses and baggage. The remainder of the infantry followed, but more slowly, as some of the boats were soon wanted for other purposes.

As soon as the infantry began to land, I directed my attention particularly to the construction of a wharf.

We first brought up one of the lightest of the double canal-boats, as before described, loaded with a battery of artillery, as near to the shore as possible; this was securely anchored in the proper position at high water, when it at once grounded.

This raft was some 200 feet from the shore. Outside of it, parallel to it, and at a distance of some twenty feet from it, was placed, and securely anchored, the double canal-boat next lightest in draught of water; the space between the two being bridged by one of our heavy gang-planks.

In the same manner was placed a third double canal-boat or raft.

Then we brought up a light-draught steamer, a ferry-boat, forming the pier-head of our wharf. This "barge" also contained a battery of artillery.

We then had left one of the double canal-boats with which to form the pier-head of another wharf, which we might want hereafter, and which we could build as soon as the pontoon-boats were set at liberty.

These three (3) double canal-boats, and the "barge," carried us out some 220 feet further into the stream than we were at the beginning, and at this point we had a sufficient depth of water for our light transports to come alongside and discharge.

While this was going on outside the point of starting, the work of making a roadway from there to the shore was also being done. First, a flat-boat or scow was brought up and secured on the line between the canal-boats and the shore, and some twenty feet from the former; the connection between the two being made by a long gang-plank; then three or four of the pontoon rafts were floated into position next to the scow, the connection between them being soon made in the usual manner with barks and chess, so as to make a regular pontoon bridge.

A gang-plank for an apron established the connection with the shore, and we were now ready to discharge.

This wharf was finished before dark. Some of our artillery was already on the wharf, for a battery was in the first barge that had been placed.

The artillerists, with a detail from the infantry to assist, soon took the batteries ashore without the aid of horses, and placed them in position on the left of our line.

By 12 o'clock at night, the four batteries with the command were landed and ready for action, and the transports containing their horses were alongside of our wharf and alongside of each other, all ready to land. The officers of artillery were clamorous for their horses, particularly Captain Arnold, who displayed great energy and judgment during the whole operation.

And here I ought also to mention Captain Perry (now major), of the N. Y. 15th, whom I left in charge of the wharf during the remainder of the night and the whole of the following day. To him, more than to any one, were we indebted for the rapidity with which the landing was effected.

Shortly after 12 o'clock at night I left the wharf, and when I returned in the morning I found the artillery horses nearly all landed.

I have entered into these details of the proposed landing below Gloucester, and of the actual landing which was made at West Point, not from any vanity, but to show precisely what was done with the means we had at hand.

When the way of effecting a landing was first dis-

cussed, I found that officers of great intelligence entertained very crude notions on the subject, and many of them were disposed to "leave such matters to the sailors on the transports."

Having had a good deal of experience at different times in landing building materials, sometimes under difficult circumstances, I knew that it would not do to trust to the crews of vessels to land their cargoes, and hence I applied for a detachment of the 15th New York Regiment, and established a workshop on one of the steamers at Cheesman's Creek, where all our preparations were made. The results you have above.

Early the next morning, May 7th, the enemy came in contact with our pickets, and about 9 o'clock the firing grew serious. The affair of that day was a musketry contest in the woods; very little cannonading on either side. The plateau upon which we landed, was separated from the high land by a stream and an impracticable marsh on the west side, and by a smaller stream and ravine on the south side, leaving, however, a peninsula, about a quarter of a mile wide, between the heads of the streams. This peninsula was thickly wooded. It was the key of the position, and it was there, or rather just in front of it, that the contest for its possession took place. Our troops held it throughout the day.

The division of General Sedgwick arrived on the morning of the 7th, and were landed in the same manner during that day.

Finding our landing deficient in depth of water for a permanent dépôt for supplying the army, I examined the Pamunkey River during the next day with a view of

selecting a spot higher up, where we could make better wharf accommodations.

For our immediate wants I selected *Eltham*, a point on the right bank of the Pamunkey, some six or seven miles above its mouth.

The following day I reconnoitred the roads leading to it and from it, and commenced the construction of two temporary wharves. In the course of the day Colonel Ingalls and Colonel Clarke arrived, with some of the quartermaster and commissary transports.

On the 10th I received instructions from General McClellan, through General Franklin, to proceed up the river as high as Cumberland, and report as to the possibility of carrying our transports to that point.

With two gunboats and a steamer we proceeded up the river to an island some few miles below Cumberland. Here we found the river obstructed by a line of sunken vessels, extending from the island to either shore.

The obstructions *looked* formidable, but a short reconnoissance in boats showed that we could pass with our vessels between two of the sunken vessels.

We did so, and then anchored for the night.

Next morning, just at sunrise, we reached Cumberland, where we found General Stoneman had arrived the night before.

The examination showed that there was sufficient water for our light transports as far up as Cumberland, and that we could easily make wharves there. I accordingly sent back Captain Arnold, of the Artillery, to report to this effect.

Learning here some particulars that led me to suppose we might go still higher up the river, I determined to proceed to the White House, where the railroad from West Point to Richmond crosses the Pamunkey River.

We reached there early in the day, and finding that General Stoneman had thrown forward a squadron of cavalry to that place, I was enabled to go on shore and make such a thorough examination as induced me to believe that this was the proper spot for our final dépôt of supplies.

Deeming this information of great importance, I took the lightest draught steamer and returned to Eltham the following night, and early next morning reported to General Franklin the result of my observations.

During the day (the 12th), I joined the army on the march towards Cumberland, and reported in person to General McClellan when he reached that place, on Tuesday, the 13th of May.

Very respectfully,

(Signed)

B. S. ALEXANDER,

Lt.-Col. A. D. C.

SUB-REPORT NO. 2.

REPORT OF BRIG.-GEN. D. P. WOODBURY.

HEAD-QUARTERS ENGINEER BRIGADE,
CAMP NEAR NEW BRIDGE, VA.,

May 29th, 1862.

GENERAL J. G. BARNARD, Chief Engineer A. P.

GENERAL:—Pursuant to your circular of May 21st, requiring reports of the operations of the Engineer Brigade, I have the honor to render the following report of the operations of the 15th and 50th regiments composing Engineer Brigade since its arrival at White House Point, May 18th.

On the 21st, the 15th regiment was divided into three detachments, assigned to Captains Perry, Ketchum, and Chester, respectively.

Captain Perry's detachment was assigned the duty of collecting the canal-barges loaded with engineer property at White House, fitting out pontoon trains, &c.

A train of thirty-four (34) pontoon-boats, with their accessories for the construction of a bridge, each boat containing the materials for one bay, was fitted out and securely anchored, ready for immediate use, and the extra pontoon-boats safely moored. Captain Perry with his detachment rejoined his regiment at Coal Harbor on the 25th inst.

The second detachment, under Captain Ketchum, was

assigned the duty of repairing roads and bridges on common roads.

I condense from his daily reports as follows:

"May 19th.—Monday night, built bridge where the main road from White House crosses Black Creek; single span, 26 feet; 5 ten-inch stringers; covering, 2 and 3 inch plank.

"May 20th.—Corduroyed 1,000 feet of road, about one mile west of Black Creek. The same afternoon, took up and rebuilt bridge over Mill Creek at the grist-mill; two spans, 18 and 20 feet; roadway, 12 feet; 4 pine stringers, 9 inches; covering, 2-inch oak plank.

"May 21st.—Overtook the advance. Reported to General Franklin; received instructions from him to go ahead on New Bridge road. Went on and encamped about 1,000 feet inside of our pickets; unable to get to the site of New Bridge, on account of the presence of the enemy on north side of the river.

"May 22d.—Unable still to take any measurement of the bridge, which condition of things continued until Sunday.

"May 25th.—Took measurement, and commenced framing bridge.

"May 26th.—Completed framing of bridge.

"May 27th.—Getting out saw-logs, to be cut into plank for covering bridge. Engaged all night in hauling timber to site of bridge.

"May 28th.—Finished hauling timber and plank to site of bridge, after night.

"May 29th.—Took possession of saw-mill; got out timber for permanent bridges. Length of bridge over

the Chickahominy River, known as New Bridge, 114 feet, with 7 spans; 10-inch stringers, 4 in number; width of roadway, 10 feet."

The third detachment, under Captain Chester, was also assigned the duty of repairing common roads and bridges. I condense from his daily report as follows:

"May 18th.—I have followed the roads along which General Stoneman's command passed, repairing such as required it, and laying corduroy and building small bridges.

"May 19th and 20th.—Laid corduroy and graded about 150 feet road, near the first crossing of the turnpike road and the railroad, after leaving White House. Also, built four small bridges and laid corduroy at various points on the road along which General Franklin's command passed, from the crossing of Black Creek to a point half a mile beyond the blacksmith's shop; in all about 1,000 feet of road corduroyed, and much ditching and grading.

"Finding the road crossing the valley, about a mile and a half beyond the last point mentioned (about half a mile beyond the White Church), impassable, at midnight built three bridges across streams about 8 feet wide and 5 feet deep; used in each 9 or 10 stringers, of from 10 to 15 inches in diameter, laid on crib abutments. Also, laid corduroy over about 800 feet of road, in manner as follows: Longitudinal stringers were first laid; over these, sticks averaging seven inches in diameter; the interstices again filled with smaller sticks, and the whole covered with brush and dirt. A large portion of the force was kept constantly employed in ditch-

ing and grading, and the work thus performed was not less valuable than that before described.

“From this time until the present date, my detachment has followed the roads over which General Franklin’s division passed; leaving the Hanover road, however, at the cross-road near present head-quarters, by General Woodbury’s order, for a point nearly on Chickahominy Creek, about a mile above New Bridge.

“The work executed on the road since then is too various in character to describe in detail. I will mention, however, important work performed near each of the two mills; also, that since we have been encamped near the Chickahominy, roads have been cut through the woods, in aggregate about three-fourths of a mile in length, about fifty feet in width; and have collected about 1,000 heavy sticks, to be laid in the bottom for small bridges and corduroys.

“The men have worked cheerfully and faithfully, at whatever hour I have called them out; and I am much indebted to the officers for their energetic co-operation.”

The 50th regiment was also divided into several detachments. One detachment, under Lieutenant Roosa, was left at White House Point, for the purpose of unloading the barges and guarding the engineer property at that point.

A second detachment, under Captain Gilbert, was also left for the purpose of preparing a pontoon train. A train of thirty-four (34) boats, with their accessories for the construction of a bridge, one bay in each, was fitted out and anchored, ready for immediate use. Two pontoon trains complete are now moored at White House

Point, ready for use for transports by land or water, with all accessories.

A third detachment, under Captain Spaulding, was assigned to the duty of constructing trestle bridges. I condense from the report of Colonel Stuart, his commanding officer, as follows :

“The detachment under Captain Spaulding, consisting of companies C and E, put in a trestle bridge over the Chickahominy at Bottom’s Bridge crossing, and made the necessary approaches on Thursday, May 22d, and a second of the same character on Friday, May 23d. These bridges were each one hundred and twenty feet long. They are in constant use.

“Since the 23d this detachment have been making examinations for crossings, have made some roads, and transported trestles, &c., for one bridge to a point one mile above New Bridge. Captain Spaulding reports that he has two trestle bridges ready to be thrown over the Chickahominy as soon as a crossing is decided upon.

“To show the character of the bridges referred to, I will state that on Saturday last, May 24th, seventy-nine regiments, more than nine hundred wagons, and several batteries of artillery passed over these two bridges at Bottom’s crossing, between sunrise and sunset, as reported to me by 1st Lieutenant Hine, of Company E, in charge of guard at that crossing.”

A fourth detachment, under Major Embeck, was assigned to duty on Richmond and York River Railroad. He reports as follows :

“I commenced work on the railroad bridge near Tunstall’s Station, on Monday, May 10th, 1862, and

on Saturday, the 24th, about 5½ P. M., the first locomotive passed over. The bracing and filling up around mudsills was completed on the 26th. This bridge consists of one span fifty feet, twenty-one feet high, of trestle-work, and would have been completed much sooner but for the lack of facilities for getting timber from the woods to the bridge, the scarcity and very indifferent assortment of tools, and some bad weather. The detachment also repaired a portion of the track, which work was finished on Tuesday, May 27th."

A fifth detachment, under Colonel Stuart, was also assigned to the same duty.

He reports as follows:

"On Friday morning, May 23d, I reached the railroad bridge over the Chickahominy, with detachments from Companies I and K, where I found three spans of trestle-work, each eleven feet wide and fifteen feet high, and one truss span of forty-four feet, same height, entirely destroyed by fire. Two other trestle-spans were partially destroyed. Found a hand-car and quantity of timber at a saw-mill three miles east of bridge, near the track, which were brought up and work commenced. On Sunday, the 25th, Captain O'Grady and First Lieutenant Andrus, of this regiment, made a thorough examination of the bridge west of the portion destroyed, about one thousand feet in length, and also of the track for four miles west to Fair Oak Station, and reported the bridge-work in safe condition for passing over.

"On Monday morning the trestle-spans were repaired and works commenced on truss-span, when Engineer Charles McAlpine arrived with forty bridge carpenters

of the government bridge-builders, and a car-load of sawed timber, and full supply of necessary tools. With their valuable aid, the bridge was completed on Tuesday, May 27th, at 7 p. m., when a locomotive passed over the bridge and went three miles beyond. I have left ten men as a guard at the bridge until relieved, and respectfully recommend that a larger guard be sent there from some other regiment, as the bridge is long and high, and requires a much larger guard."

RECAPITULATION.

BRIDGES BUILT AND REPAIRED.

One bridge, single span, twenty-six feet, at Black Creek. One bridge, two spans, eighteen by twenty feet, respectively. Roadway, twelve feet, at Mill Creek.

Four small bridges on the turnpike between Black Creek and a point half a mile beyond the blacksmith's shop.

Three bridges between the last point mentioned and half a mile beyond the "White Church," over streams eight feet in width and five in depth, built with stringers laid on crib abutments.

Two trestle bridges, 120 feet in length, across the Chickahominy, at Bottom's Bridge.

Timber got out and framed for a bridge across the Chickahominy, at "New Bridge," 114 feet in length, seven spans.

Two trestle bridges ready to be thrown at the same spot.

RAILROAD BRIDGES.

One bridge; one span, fifty feet in length, twenty-one feet in height; trestle-work near Tunstall's Station.

One bridge; three spans, trestle-work, each eleven feet in width, fifteen feet in height; one truss-span, forty-four feet in width, twenty-one feet in height; two trestle-spans repaired over the Chickahominy; assisted by forty government bridge-builders.

ROADS REPAIRED.

150 feet graded and corduroyed, on the turnpike from White House, at railroad crossing.

1,000 feet ditched, graded, and corduroyed, between Black Creek and a point half a mile beyond the blacksmith's shop.

800 feet ditched, graded, and corduroyed near "White Church."

4,000 feet road, fifty feet in width, cut through the woods, near the Chickahominy.

1,000 feet corduroyed, one mile west of Black Creek.

1,000 sticks cut and collected for corduroying the road near New Bridge.

Respectfully submitted,

(Signed)

D. P. WOODBURY,

Brig.-Gen. Volunteers.

SUB-REPORT NO. 3.

REPORT OF CAPT. J. SPAULDING, 15th
N. Y. S. V.CAMP NEAR NEW BRIDGE, *June 29th*, 1862.

GENERAL:—In obedience to your orders, I went to the river night before last with a part of my detachment, at the point selected by you for the crossing, and commenced the necessary preparations for laying the bridge.

Owing to the sudden rise of the river having floated all the bridge material at the point where it had been deposited, to prevent its being observed by the enemy, it became necessary for me to remove all the material to higher ground, to prevent its being carried off before it could be used in the bridge. As this work was nearly all done in the water, the operation was necessarily a slow one, so that I did not get to work at the construction of the bridge until about daylight.

When I had the bridge about three-fourths completed, the second trestle-cap from the bank broke, making it necessary for me to dismantle all of the bridge except one span, to put in a new cap.

When the bridge was again entirely completed across the main stream, I found that the rapid current was fast undermining the legs of the trestle in the main channel, and I was compelled to dismantle forty feet of the

bridge about the centre, and put in one of the pontoon-boats.

Owing to the delay caused by these reconstructions, the time occupied in constructing the bridge was longer than I expected ; but the south abutment was put in and the bridge finished at noon yesterday.

When the bridge was completed yesterday I returned to camp, leaving the approach at the south side of the river to be built by Captain Chester. During the construction of the bridge, the approach on this side was built by Captain Perry, of the 15th, who also rendered me valuable assistance in securing the north end of the bridge.

With the slight changes suggested by you, to accommodate the bridge to the falling or lower stage of water, and which I hope to have finished before the south approach is ready for use, the bridge is perfectly secure for infantry in two ranks, and as safe for the passage of artillery as this plan of trestle can be made, without strengthening it beyond the original plan.

Of the time required to complete the south approach, I am not able to speak with any certainty, as I am not familiar with the ground.

Very respectfully,

(Signed)

J. SPAULDING,

Captain.

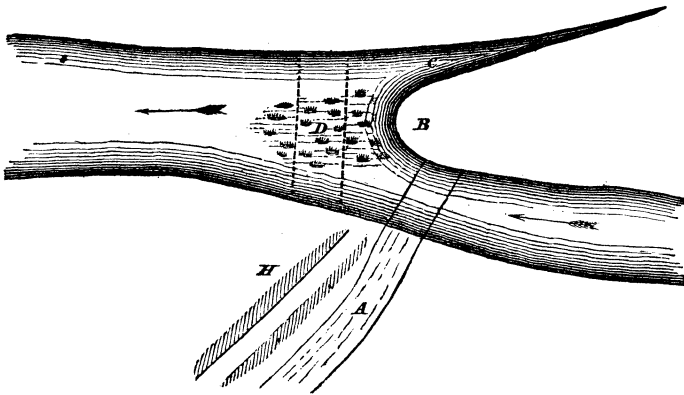
TO BRIG.-GEN. D. P. WOODBURY,
Commanding Engineer Brigade.

SUB-REPORT NO. 4.

REPORT OF CAPT. WESLEY BRAINERD, 50th
N. Y. S. V.CAMP NEAR NEW BRIDGE, *June 2d*, 1862.GEN. D. P. WOODBURY,
Commanding Engineer Brigade.

SIR:—A greeably to your instructions, I proceeded on Saturday afternoon last (May 31st) to make a reconnoissance of the Chickahominy in the direction previously indicated by you, with a view to determine the most favorable position for a bridge.

I succeeded in finding a very good approach to the stream at about dark. The following sketch shows the character of the spot selected, as it then appeared.



A, represents the road leading to the approach. B, a point of land opposite, apparently the mainland. *c* appeared to be a small swale, which at that time could have been crossed by one or two trestles or corduroy. D represents land partially covered by water, and filled with brush and trees. H, a ditch running parallel with the road.

As I have but 120 feet of bridge, I concluded to place it in the direction of A B, and, in my opinion, had the water remained at the same height as at the time I made the reconnoissance, the bridge could have been laid with little difficulty. I received your order to construct the bridge at about 11 o'clock, and proceeding with the train to the spot, found the stream somewhat swollen and rising rapidly.

After cutting away the brush at the side of the stream, I commenced laying the bridge three feet above the level of the water. The water continued rising very fast, and the current became so swift as to render the work extremely difficult; at about 4 o'clock I had succeeded in placing three lengths of trestles, when I was relieved by Captain Ketchum, 15th Regiment N. Y. V., and returned with my men to camp. At that time the water had risen so as nearly to submerge the bridge.

Very respectfully, your ob't servant,

(Signed)

WESLEY BRAINERD,

Capt. Co. C, 50th Regt. N. Y. S. V.

SUB-REPORT No. 5.

REPORT OF CAPT. W. A. KETCHUM.

CAMP OF DETACHMENT, 15TH REGIMENT N. Y. V. E.,
NEAR NEW BRIDGE, VA., *June, 2d, 1862.*

Gen. D. P. WOODBURY,
Commanding Engineer Brigade.

GENERAL:—Agreeably to your instructions, I proceeded to the bridge below New Bridge, arriving there at about 7 o'clock in the morning of yesterday. My instructions were, to relieve Captain Brainerd and his command, and then to make an examination, to determine at what point the direction there being pursued would strike the opposite bank; the nature of the soil at such point, and the length of bridge required; and, if I deemed it necessary, to change the direction of the structure.

Soon after my arrival on the ground, a canvas pontoon was brought, of which I took possession, and commenced making the examination above alluded to.

When about half way across the stream, I was ordered to return by Colonel Lansing, of the 17th N. Y. V. (who said that he had special instructions from General McClellan to see that bridge completed), and by Lieutenant-Colonel Pettes, of your brigade. I returned to the shore, and endeavored to find you, to report the above facts; not succeeding, I was ordered by both of

the gentlemen above named to go to work on the bridge, which I did, and continued working in that direction until your arrival on the ground, at about nine o'clock when the necessary examination was made, and the direction of the bridge changed.

Having commenced another bridge in the new direction, every thing went on smoothly until I reached the sixth trestle, when, owing to the rapid rise of the water, I deemed it necessary to raise the abutment; in endeavoring to do which (having raised the shore-ends of the balks), the whole structure surged in shore, and fell with a crash.

I immediately went to work clearing away the wreck, and am happy to state that nothing was either lost in the current or broken.

When every thing was cleared away, I commenced rebuilding, and connected with the opposite shore at about 2 o'clock this morning.

I would also beg leave respectfully to report, that I was very much annoyed by the constant interference of officers higher in rank than myself, who came to me, ordering me to hurry up the work, and representing that they had the authority of the General Commanding.

Hoping that you will deem this report satisfactory,

I remain your obedient servant,

(Signed)

WILLIAM A. KETCHUM,

*Capt. 15th Regt. N. Y. V. Engineers,
Commanding Detachment.*

SUB-REPORT NO. 6.

PERSONAL REPORT OF COL. B. S. ALEXANDER.

CAMP NEAR HARRISON'S LANDING, *July 12th*, 1862.

BRIG.-GEN. J. G. BARNARD,
Chief Engineer Army of the Potomac.

SIR:—The following is a short statement of the operations upon which I have been engaged since I last submitted a report to you. Events have been so crowded that I have found it impossible to report at an earlier day.

On Thursday, the *26th of June*, I laid out a battery for thirty guns on the hill in advance of General Franklin's right—to the west of Golding's farm—intending that this should be the principal position for our artillery to drive the enemy from his position at "Old Tavern," "Mrs. Price's," and the two Garnetts. Thursday night we broke ground, with two regiments for the working party—two other regiments being the guards. Although we were within rifle-shot of the enemy's pickets, we were not disturbed, and by morning we were under good cover.

Friday, the 27th.—General Porter was attacked in force on the other side (left bank) of the Chickahominy, and a heavy cannonade being opened about noon on General Smith's position at Golding's, the working party were withdrawn—but the work was still held by our

infantry, and it contributed materially in enabling us to repel the attacks of the enemy during that day. During the afternoon, seeing that General Porter was being driven back towards our lower bridges, I suggested to General Franklin the propriety of destroying Duane's Bridge and the foot-bridge below it. General Franklin acquiesced, and I put a regiment at Duane's Bridge and a company at the foot-bridge, and before sunset they were well torn to pieces.

It is worthy of remark, that when I proceeded to this work I found a small party had already commenced the work of destruction,—about a platoon at Duane's Bridge and six men at the foot-bridge; by whose orders they had gone to work I did not learn.

Saturday, the 28th.—General Franklin changed front, withdrawing from Golding's plain and the redoubt there. After assisting in the necessary slashing in front of the new line, and in placing Carlisle's battery in position near Courteney's house, I inspected our line of defence to the left as far as Fair Oaks. Returning in the afternoon, I was told by General Franklin that you wished to see me at head-quarters, near Savage's Station. I immediately proceeded thither, and received your instructions to take Lieutenants Comstock and Farquhar with me and proceed to James River, and look for an eligible position to which the army might retreat and establish a new base of operations. While waiting for an escort the General-in-chief sent for me, and reiterated your instructions. It may be remarked, that the idea at that time was to take up a line joining the James and Chickahominy; at least, such was *my* idea.

Lieutenant Comstock and myself left Savage's Station about twelve o'clock Saturday night. We stopped with General Woodbury, near the White Oak Swamp Bridge.

In the morning of *Sunday, the 29th*, we proceeded to the head-quarters of General Keyes, where we found the escort under Major Pleasanton, of the 2d Dragoons, had halted. Hearing the firing in General Keyes's front, I rode forward to the *débouché* of the road over which General Sykes crossed the White Oak Swamp, and tried to get some axes to make a slashing across the roads leading from the "Quaker road" to Richmond, but in vain. Had one hundred good axemen been put at work on these roads during that day, we would probably have been spared the subsequent battles of Monday and Tuesday. Returning, I saw General McClellan, for whom I sketched the roads as far as I had seen them, and from whom I received orders to try and communicate with our fleet on James River.

We started at 12 M., and arrived at Carter's Landing at 5 P. M. We met no enemy. I immediately procured a boat and communicated with the gunboats below City Point.

Returning to Carter's about seven, I reported in writing to General McClellan, and sent an officer and ten men to act as guides in conducting columns to that place. I left a gunboat at Carter's to protect the escort, and proceeded up the river to see Captain Rogers, of the "Galena," in command of the fleet. After stating to him the condition of affairs, he sent a boat down the river to order up the supply vessels as far as Harrison's Landing. But finding him of opinion that the gunboats

could not keep the river open for supplies above Fort Powhatan, and that the true position for the army was at "Dancing Point," the mouth of the Chickahominy, we decided to proceed thither.

As, however, I could not concur in this opinion at that time, and as it was then dark, we decided to remain where we were till morning.

Monday, the 30th.—We proceeded up the river to the bend above the mouth of Turkey Creek, to the point where the bluffs on the right bank command the river, and also the opposite shore. Returning, we stopped at Carter's, where I ordered Major Pleasanton to send out parties on all the roads, inform himself fully about them, and report direct to head-quarters.

I desired him to communicate, if possible, with the gunboats supposed to be up the Chickahominy, as I intended to return with one of his parties. I also instructed him to draw rations for the sick and wounded, several hundred of whom were already there. Leaving Carter's about 12 m. in the "Port Royal," Lieutenant Morris commanding, we proceeded to the mouth of the Chickahominy, but in going over the bar we got aground, and remained there till next morning.

Tuesday, the first of July, we proceeded up the Chickahominy about twenty-five miles, to the "Window Shades;" here we found three boats, and learned that this point was the head of navigation. Stopping there only a few minutes, I took a smaller vessel and returned to Turkey Creek as soon as possible. Major Pleasanton's cavalry, although it had been within a few miles of the Chickahominy, did not reach its banks.

Wednesday, the 2d, I found General McClellan, shortly after daylight, on board the "Galena," to whom I reported in writing, having prepared my report the evening before. As this report is a matter of record, it is unnecessary to allude to it further at this time.

The General told me that he had determined to go to Harrison's Landing, and that I would be wanted there as soon as possible, to look to our lines of defence. He left early in the morning; when he had gone I asked the captain of the "Delaware" to set me ashore at Carter's, some three miles below; this he thought it imprudent to do, as his was the only gunboat left behind, and he might want all his crew at any moment. About 3 P. M. we landed at Carter's, but we found that Major Pleasanton had left with our horses early in the morning; so we were forced to go to Harrison's Landing by water. I found your tent just at dark, but did not succeed in seeing you till early next morning.

Thursday, the 3d.—In company with Captain McAlester and Lieutenant Comstock, I rode over the ground on our front, and before night, assisted by the sketch which you gave me that morning, I was enabled to give the General-in-chief such information as he desired, to enable him to give orders about posting the troops. The nature of Herring or Bird's Creek, and the necessity of holding its left bank, I had ascertained from the masthead when I went down the James River, a few days before.

Friday, the 4th, Saturday, the 5th, Sunday, the 6th, and Monday, the 7th, I was engaged without intermission in fixing the details of our line of defence, in laying

out works, directing the proper slashings, making communications, etc., etc. To Captain McAlester I assigned the supervision of the works on the hill in front of our centre; to Lieutenant Comstock, the defence of the line of Kimage's Creek on our left; and to Lieutenant Farquhar, the construction of the works and rifle-pits on our right.

These works are now well advanced towards completion. In two days more, if the troops do their duty, they will be finished.

Late in the evening of the 7th, just as I had finished laying out the last line to which I thought it necessary to give my special attention—the withdrawing of General Kearney's right so as to form a proper connection with General Franklin—the General-in-chief sent for me to meet him on the steamer "Metamora."

He wished me to make a more minute examination of the opposite shore, with a view of occupying it. This I did on *Tuesday, the 8th*, and reported to him that I considered the most dangerous point for our flotilla to be the wooded shore on the opposite bank, just above Mr. Cole's house—nearly opposite the mouth of Herring Creek.

Wednesday, the 9th, Thursday, the 10th.—Overcome by the great heat, and my previous exertions and anxiety about our situation, I was warned to seek rest.

Friday, the 11th.—I rode over the whole line, but as it was raining, the troops were doing but little.

All of which is respectfully submitted.

(Signed)

B. S. ALEXANDER,

Lt.-Col. A. D. C.

GENERAL BARRY'S REPORT

OF THE ORGANIZATION OF THE ARTILLERY OF THE ARMY OF
THE POTOMAC.

WASHINGTON, *Sept. 1st, 1862.*

BRIG.-GEN. S. WILLIAMS,

Assistant Adjutant-General:

GENERAL:—In compliance with the orders of Major-General McClellan, I have the honor to give some account of the history, organization, and operations of the Artillery of the Army of the Potomac, from July, 1861, to September, 1862—the period during which I was its chief.

When Major-General McClellan was appointed to the command of the "Division of the Potomac," July 25th, 1861, a few days after the first battle of Bull Run, the whole field artillery of his command consisted of no more than parts of nine batteries, or thirty pieces of various, and, in some instances, unusual and unserviceable calibres. Most of these batteries were also of mixed calibres. My calculations were based upon the expected immediate expansion of the "Division of the Potomac" into the "Army of the Potomac," to consist of at least 100,000 infantry. Considerations involving the peculiar character and extent of the force to be employed; the probable field and character of operations; the utmost efficiency of the arm; and the limits imposed by the

as yet undeveloped resources of the Nation, led to the following general propositions, offered by me to Major-General McClellan, and which received his full approval:

1. That the proportion of the artillery should be in the ratio of at least two and a half pieces to 1,000 men, to be expanded, if possible, to three pieces to one thousand (1,000) men.

2. That the proportion of rifled guns should be one-third, and of smooth-bores two-thirds. That the rifled guns should be restricted to the system of the United States Ordnance Department, and of Parrott; and the smooth-bore (with the exception of a few howitzers for special service) to be exclusively the 12-pounder gun of the model of 1857, variously called the "gun howitzer," the "light 12-pounder," or the "Napoleon."

3. That each field battery should, if practicable, be composed of six guns, and none to be of less than four guns; and in all cases the guns of each battery should be of uniform calibre.

4. That the field batteries were to be assigned to "divisions," and not to brigades, and in the proportion of four to each division; of which one was to be a battery of regulars, the remainder of volunteers. The captain of the regular battery to be the commandant of the artillery of the division. In the event of several divisions constituting an army corps, at least one-half of the divisional artillery was to constitute the reserve artillery of the corps.

5. That the artillery reserve of the whole army should consist of one hundred (100) guns, and should com-

prise, besides a sufficient number of light "mounted batteries," all the guns of position, and, until the cavalry was massed, all the horse artillery.

6. That the amount of ammunition to accompany the field batteries was not to be less than 400 rounds per gun.

7. A siege-train of fifty pieces. This was subsequently expanded for special service, at the siege of Yorktown, to very nearly one hundred pieces, and comprised the unusual calibres, and enormously heavy weight of metal, of two 200-pounders, five 100-pounders, and ten 13-inch sea-coast mortars.

8. That instruction in the theory and practice of gunnery, as well as in the tactics of the arm, was to be given to the officers and non-commissioned officers of the volunteer batteries, by the study of suitable text-books, and by actual recitations in each division, under the direction of the regular officer commanding the divisional artillery.

9. That personal inspection, as frequent as the nature of circumstances would permit, should be made by me, to be assured of the strict observance of the established organization and drill, and of the special regulations and orders from time to time issued under the authority of the Commanding General; and to note the progressive improvements of the officers and men of the volunteer batteries, and the actual fitness for field service of the whole, both regular and volunteer.

A variety of unexpected circumstances conspired to compel in some degree trifling modifications of these

propositions; but in the main they scrupulously formed the basis of the organization of the artillery of the "Army of the Potomac."

The sudden and extensive expansion of the artillery arm of the nation, taxed far beyond their capacities the various arsenals and the private foundries which had hitherto exclusively supplied to the United States the requisite ordnance *matériel*.

The Ordnance Department promptly met my requisitions by enlarging, as far as possible, the operations of the arsenals of supply and construction, and by the extensive employment of private contractors. The use of contract work, while it gave increased facility in meeting promptly the suddenly increased demand, was the unavoidable cause of introducing into the service much inferior ordnance material. The gun-carriages were particularly open to this objection, and their bad construction was in more than one instance the unfortunate occasion of the loss of field-guns.

It affords me great satisfaction to state that the Ordnance Department, in the main, kept the supply constantly up to the demand, and by the careful and ready attention to complaints, and the prompt creation of the requisite means, enabled me to withdraw inferior *matériel*, and substitute such as was found to be more reliable. To Lieutenant-Colonel Ramsay, in command of the Washington Arsenal; to Lieutenant Bradford, his assistant, and to Captain Benton, in the office of the Chief of Ordnance, these remarks in particular apply. To their promptness, industry, and active general co-operation am I indebted in a great degree for the means

which enabled me to organize such an immense artillery force in so short a time.

As has been before stated, the whole of the field artillery of the "Division of the Potomac," July 25th, 1861, was comprised in 9 imperfectly equipped batteries of 30 guns, 650 men, and 400 horses. In March, 1862, when the whole army took the field, it consisted of 92 batteries of 520 guns, 12,500 men, and 11,000 horses, fully equipped, and in readiness for active field service. Of the whole force, 30 batteries were regulars, and 62 batteries volunteers. During this short period of *seven months*, nearly all this immense amount of *matériel* was issued to me, and placed in the hands of the artillery troops after their arrival in Washington. About one-fourth of all the volunteer batteries brought with them from their respective States a few guns and carriages; but they were nearly all of such peculiar calibre as to lack uniformity with the more modern and more serviceable ordnance with which I was arming the other batteries, and they had therefore to be withdrawn and replaced by more suitable *matériel*. While about one-sixth came supplied with horses and harness, less than one-tenth were apparently fully equipped for service when they reported to me. All of these latter required the supply of many deficiencies of *matériel*, and every one of the whole number very extensive instructions in the theory and practice of their special arm. When the Army of the Potomac, on the 1st of April, 1862, embarked for Fort Monroe and the Virginia Peninsula, the field artillery which had been organized under my direction was disposed as follows :

	Bat.	Guns.
Detached for service in the Department of South Carolina.	2	12
Detached for service in the Department of North Carolina.	1	6
Detached for service in the Department of the Gulf.....	1	6
Command of Major-General Dix (Baltimore).....	3	20
Detached for service in the Mountain Department (Division of General Blenker).....	3	18
1st Corps (Major-General McDowell).....	12	68
5th Corps (Major-General Banks).....	12	59
Defences of Washington (Brigadier-General Wadsworth)	6	32
	<hr/> 40	<hr/> 221
Embarked (March 15th to April 1st) for the Peninsula	52	299
	<hr/> 92	<hr/> 520

The operations on the Peninsula by the Army of the Potomac commenced, therefore, with a field battery force of 52 batteries of 299 guns. To this must be added the field artillery of Franklin's Division of McDowell's Corps (4 batteries of 22 guns), which joined a few days before the capture of Yorktown, but was not disembarked from its transports for service until after the battle of Williamsburg; and the field artillery of McCall's Division of McDowell's Corps (4 batteries of 22 guns), which joined in June, a few days before the battle of Mechanicsville (June 26th, 1862); making a grand total of field artillery at any time with the Army of the Potomac, on the Peninsula, of 60 batteries of 343 guns.

With this large force, serving in six *corps d'armée* of eleven divisions, and the artillery reserve, the only general and field officers were: 1 brigadier-general, 4 colonels, 3 lieutenant-colonels, and 3 majors; a number obviously insufficient, and which impaired to a great degree the efficiency of the arm, in consequence of the

want of rank and official influence of the commanders of corps and divisional artillery. As this faulty organization can only be suitably corrected by legislative action, it is earnestly hoped that the attention of the proper authorities may be at an early day invited to it. Where there were so many newly organized volunteer field batteries, many of whom received their first and only instruction in the intrenched camps covering Washington during the three or four inclement months of the winter of 1861-'62, there was of course much to be improved. Many of the volunteer batteries, however, evinced such zeal and intelligence, and availed themselves so industriously of the instructions of the regular officers, their commanders, and of the example of the regular battery, their associate, that they made rapid progress, and finally attained a degree of proficiency highly creditable. Special detailed reports have been made and transmitted by me of the general artillery operations at the siege of Yorktown; and by their immediate commanders, of the services of the field batteries at the battles of Williamsburg, Hanover Court-House, and those severely contested ones comprised in the operations in front of Richmond. To those several reports I respectfully refer the Commanding General for details of services as creditable to the artillery of the United States, as they are honorable to the gallant officers, and brave and patient enlisted men, who (with but few exceptions), struggling through difficulties, overcoming obstacles, and bearing themselves nobly on the field of battle, stood faithfully to their guns, performing their various duties with a steadiness,

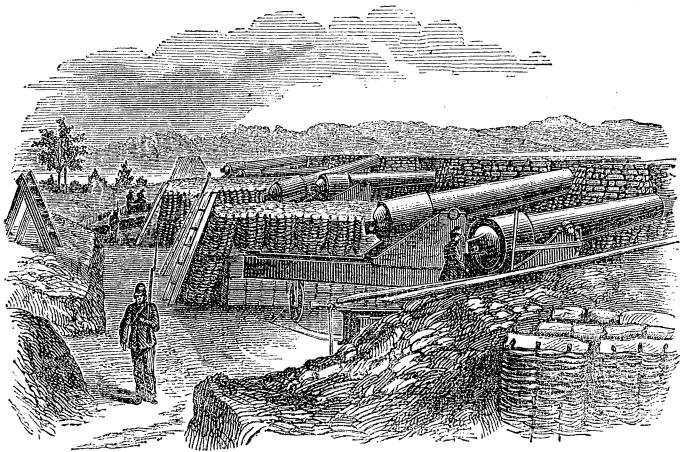
a devotion, and a gallantry worthy the highest commendation. For the artillery of the Army of the Potomac it is but simple justice to claim, that in contributing its aid to the other two arms, as far as lay in its power, it did its whole duty faithfully and intelligently; and that on more than one occasion (at the battle of Malvern particularly), it confessedly saved the army from serious disaster.

I am, General, very respectfully,

Your obedient servant,

WILLIAM F. BARRY,

*Brigadier-General Inspector of Artillery U. S. A. (late
Chief of Artillery Army of Potomac).*



Northeast view of Battery No. 1, at Farinholt's House, York River.

GENERAL BARRY'S REPORT—No. II.

OF ARTILLERY OPERATIONS AT THE SIEGE OF YORKTOWN,
APRIL 5 TO MAY 5, 1862.

HEAD-QUARTERS CHIEF OF ARTILLERY,
ARMY OF THE POTOMAC, *May 5, 1862.*

BRIG.-GEN. S. WILLIAMS,
Assistant Adjutant-General :

GENERAL:—I have the honor to make the following general report of the operations of the artillery at the siege of Yorktown.

The army having arrived in front of the enemy's works, April 5th, went into camp, and preparations were at once commenced for the siege. From this date until April 10th, active reconnoissances of the enemy's lines and works were pushed by the Commanding General. By his orders I examined the various inlets and creeks, for the purpose of selecting a suitable place for landing the siege-train. Cheeseman's Creek, an affluent of the Poquosin River, about two miles and a half from the proposed location of our works, was selected, as possessing the greatest advantages of deep water, a good landing, and facility of approach. The siege-train dépôt was established in a large open field, about one mile and a half from the landing, and at the junction of the roads forming the approaches to the various batteries.

The siege-train consisted of 101 pieces, as follows, namely:

2	200-pounder Parrott rifled guns.
11	100 " " "
13	30 " " "
22	20 " " "
10	4½-inch rifled siege-guns.
10	13 " seacoast mortars.
10	10 " " "
15	10 " siege-mortars.
5	8 " " "
3	8 " " howitzers.

Field-batteries of 12-pounders were likewise made use of as guns of position.

To serve this siege-train, the First Connecticut artillery, Colonel Tyler (one thousand four hundred men), and the Fifth New York volunteers, Colonel Warren (eight hundred men), were placed under my orders.

Upon consultation with the Commanding General and the Chief Engineer (General Barnard), the following location of batteries and distribution of guns were decided upon:

BATTERY No. 1.—In front of Farinholt's house, on the right bank of Wormley Creek, and at its junction with York River; to command the water-front of Yorktown and Gloucester, and the extreme left of the enemy's land-side works.

Distance.—5,000 yards to work on Gloucester Point; 4,800 yards to Yorktown wharf; 4,000 yards to centre of Yorktown; 3,800 yards to enemy's long-range rifled guns on "high bastion."

Armament.—Two 200-pounder Parrott rifled guns; five 100-pounder Parrott rifled guns.

Garrison.—One battery First Connecticut artillery, Capt. Burke; Major Kellogg commanding.

BATTERY No. 2.—In front of enemy's line bearing on Yorktown and Hampton stage-road (in first parallel).

Distance.—1,800 yards to Red Redoubt (left); 1,900 yards to enemy's long-range rifled guns on "high bastion" (right).

Armament.—Three $4\frac{1}{2}$ -inch rifled siege-guns; six 30-pounder Parrotts; six 20-pounder Parrotts.

Garrison.—Two batteries First Connecticut artillery; one battery First battalion New York artillery; Major Hemingway, First Connecticut artillery, commanding.

BATTERY No. 3.—In first parallel, 200 yards to the left of Battery No. 2.

Distance.—1,900 yards to Red Redoubt; 2,300 yards to long-range rifled guns in "high bastion."

Armament.—Seven 20-pounder Parrott guns.

Garrison.—Two batteries First battalion New-York artillery, Captain Voeglee commanding.

BATTERY No. 4.—In ravine under plateau of "Moore's house."

Distance and Compass-Bearings.—To Gloucester Point, N. 28° W. 4,100 yards; to Yorktown wharf, N. 43° W. 3,500 yards; to Yorktown, N. 49° W. 2,400 yards.

Armament.—Ten 13-inch seacoast mortars.

Garrison.—Two batteries First Connecticut artillery, Captains Dow and Harmon; Major Alex. Doull, second New York artillery, commanding.

BATTERY No. 5.—Beyond Warwick Court-House stage-road, in front of Red Redoubt.

Distance.—To Yorktown, 2,800 yards; to high bastion, 2,000 yards; to Red Redoubt, 1,600.

Armament.—Eight 20-pounder Parrotts.

Garrison.—Battery E, Second United States artillery, and one-half of Battery "C," First battalion New York artillery; Captain Carlisle commanding.

BATTERY No. 6.—Junction of Warwick and Hampton Roads.

Distance and Compass-Bearings.—To Gloucester Point, N. 3° E. 5,100 yards; to Yorktown wharf, N. 5° W. 3,900 yards; to Yorktown, N. 2,775 yards; to Wynn's Mills, S. 45° W. 2,500 yards; to Red Redoubt, N. 32° W. 2,000 yards.

Armament.—Six 10-inch seacoast mortars.

Garrison.—One battery; Captain Burbank, First Connecticut artillery, commanding.

BATTERY No. 7.—In front of Wynn's Mills.

Distance.—To Wynn's Mills works, 1,100 yards.

Armament.—Six field 12-pounders.

Garrison.—A field-battery.

BATTERY No. 8.—In front of works south of Wynn's Mills.

Distance.—1,125 yards.

Armament.—Two batteries (12 guns) field 12-pounders.

Garrison.—Two field-batteries.

BATTERY No. 9.—To the left of old mill-dam.

Distance and Compass-Bearings.—To Fort, N. 20° W. 1,900 yards; to exterior works, N. 70° W. 2,000 yards.

Armament.—Ten 10-inch siege-mortars.

Garrison.—Two batteries, Captains Cooke and Rockwood, First Connecticut artillery; Major Trumbull commanding.

BATTERY No. 10.—In middle of first parallel, between right branch and York River.

Distance.—To Fort, 2,550 yards; to right Redoubt, 2,150 yards; to high Redoubt, 1,500 yards.

Armament.—Three 100-pounder Parrotts; one 30-pounder Parrott; seven 4½ inch rifled siege-guns.

Garrison.—Two companies Fifth New York volunteers; Captain Winslow commanding.

BATTERY No. 11.—At the head of ravine "E."

Distance and Compass-Bearings.—To Gloucester Point, N. 9° W. 4,700 yards; to Yorktown wharf, N. 7° W. 3,650 yards; to Fort, N. 18° W. 2,600 yards; to exterior works, N. 32° W. 2,400 yards; to Wynn's Mills, S. 52° W. 3,300.

Armament.—Four 10-inch seacoast mortars.

Garrison.—One company Fifth New York volunteers.

BATTERY No. 12.—On Peninsular plateau, behind Secession huts.

Distance and Compass-Bearings.—To exterior works, N. 78° W. 2,000 yards; to Fort, N. 20° W. 1,600 yards; to burnt house, N. 9° E. 925 yards.

Armament.—Five 10-in., and five 8-in. siege-mortars.

Garrison.—One company Fifth New York volunteers.

BATTERY No. 13.—Right of Boyau, in front of Moore's house.

Distance.—To Gloucester Point, 3,000 yards; to exterior works, 2,400 yards; to Fort 1,300 yards.

Armament.—Six 30-pounder Parrotts.

Garrison.—Two companies Fifth New York volunteers; Captain Cambreling commanding.

BATTERY No. 14.—Extremity (right) of first parallel.

Distance.—To Gloucester Point, 3,100 yards; to exterior works, 2,500 yards; to Fort, 1,400 yards.

Armament.—Three 100-pounder Parrotts.

Garrison.—One battery First Connecticut artillery; Captain Perkins commanding.

Thursday, *April 17th.*—By pushing close reconnoissances, the engineer officers have seen at least 50 guns in the enemy's works. Of these, 33 are on water-front and looking down York River, of which 23 will bear on our battery No. 1. The remainder, 17 guns, are on land-front. There are probably more, which are masked by sand-bags.

Friday, *April 18th.*—Batteries 1, 2, 3, 6, and 7 laid out, and ground broken in Nos. 1, 2, 3, and 6. At daylight working party in No. 1 well covered in; No. 2 less advanced; No. 3 progressed far enough to shelter men; No. 6 raised to height of sole of embrasures.

Saturday, *April 19th.*—Colonel Hunt, commanding artillery reserve, ordered to detail a 20-pounder Parrott battery for battery No. 3, to occupy it after dark to-night. Also, ordered to detail 54 harnessed horses to haul the 100-pounders into No. 1; the work to be continued all night. Platforms laid and magazine completed in No. 1, and all preparations made for mounting guns. Rain for past twenty-four hours, and ground soft and slippery, and altogether unfavorable for heavy work.

Monday, *April 21st.*—Batteries 4 and 5 commenced.

The officers and cannoneers of Randol's and De Russy's batteries making gabions and fascines, under Brigadier-General Woodbury; cannoneers of Lieutenant-Colonel Brickel's brigade, under Major Arndt, revetted the embrasures of battery No. 7 with gabions, and finished the battery generally; Ames's battery (A, Fifth artillery) in position in battery No. 7, relieving Diedrich's, First battalion New York artillery; 100 horses hauling siege-guns to batteries 3 and 6.

Battery No. 1.—Received from dépôt four 100-pounder Parrotts, 250 shell, 50 shot, and implements; five 100-pounders mounted; this battery now fully ready for service.

Battery No. 3.—Received from dépôt four $4\frac{1}{2}$ -inch siege-guns and platforms; two platforms laid.

Battery No. 6.—Received from dépôt six $4\frac{1}{2}$ -inch siege-guns and platforms. The artillerymen excavated the terre-plein to the depth of fourteen inches, and commenced to lay platforms. A vessel has arrived at Cheeseman's Landing with 13-inch mortars, number not known. Arrangements are made to receive these mortars when hoisted out of the vessel, and, when the present heavy weather abates, to tow them around to the immediate vicinity of the battery in which they are to be placed in position. It will be necessary to ask the assistance of the Navy to hoist them out of the transport. I respectfully request that this assistance be asked for.

April 22d.—Batteries Nos. 1, 2, 3, and 6 are now ready for service, and are supplied with implements and ammunition to the full capacity of the maga-

zines. The vessel with five 30-pounder guns has arrived, and a detachment is now discharging her. The guns will be disembarked by three or four o'clock, and if the road is repaired at that time, they will be at once hauled out to battery No. 2. Another detachment is at work on the 13-inch mortars; blocks and tackle for handling them have arrived.

April 22d, P. M.—The usual detail of cannoneers of two batteries for instruction in the manufacture of gabions, fascines, etc.; harnessed horses furnished for transportation of siege-guns; 90 barrels of powder transported from landing to dépôt.

Battery No. 1.—Two hundred and fifty cartridges supplied for 100-pounder guns; magazine arranged and drains constructed.

Battery No. 2.—Five platforms for siege-guns laid; 50 rounds of canister and 500 cartridges supplied, and implements and equipments complete for five 4½-inch guns. This battery is now ready for service.

Battery No. 6.—Platforms for five 4½-inch guns laid, and the guns put in position. The following ammunition was placed in the magazine of this battery: 600 cartridges, 300 shot, 300 shell, 100 case, 50 canister. Implements and equipments also supplied. Battery now ready for service.

I would respectfully recommend that strong infantry supports be now placed in position in the immediate vicinity of batteries 1, 2, 3, 5, and 6. Batteries 3 and 6, being particularly exposed to sorties of the enemy, should be more than usually well supported, and I would therefore recommend for each of them a section

of light artillery, in connection with the infantry supports.

April 23d.—*Battery No. 1.*—No change, except oiling guns and carriages, and finishing drains in and about the battery.

Battery No. 2.—Five platforms laid, and the battery supplied with the following ammunition: two hundred and fifty 4½-inch shot, three hundred and fifty 4½-inch shell, 100 case-shot.

Battery No. 6.—Same as battery No. 1. The following *matériel* was landed from transports and hauled to the dépôt: forty-two 10-inch carcasses, sixteen hand-barrows, three platforms. One 13-inch mortar was transferred from transport to canal-boat, which is to carry it up Wormley Creek. A detachment is ordered to work all night, to complete the transfer of the remaining four mortars. The whole number will be ready to be towed into position to-morrow night. Another detachment is ordered to work all night, disembarking five 30-pounders.

April 24th.—One hundred and seventy 30-pounder shell, ten 30-pounder shot, thirty-three shell with "Greek-fire," forty-eight 8-inch carcasses, twenty-six 10-inch carcasses transported from landing to dépôt; five 30-pounder Parrott guns transported from landing to battery No. 2.

Battery No. 2.—Five 30-pounder Parrott guns placed in position; six platforms laid, and five hundred rounds 30-pounder ammunition placed in magazine. This battery is now ready for service.

Eight 13-inch seacoast mortars were transferred from the transport to canal-boats, and will to-night, at high-

tide, be towed into Wormley Creek. Two 13-inch mortars and one 200-pounder Parrott gun will be transferred to-morrow, and, weather permitting, will also be towed into the creek.

A quantity of 10-inch shell and 100-pounder Parrott projectiles being landed from transports.

Battery No. 5.—Six platforms laid. The guns will be in position to-night, and by daybreak ready for service.

April 25th, 9 A. M.—The five 30-pounder Parrotts were placed in position in battery No. 2 last night. Ammunition supplied for the fifteen guns of that battery, and the guns transferred to their proper platforms, that is, five 20-pounders left branch; next in order, five 30-pounders; and next, five 4½-inch guns. Finishing work is now being done, but the battery is ready for immediate service. Eight 13-inch seacoast mortars, with a quantity of shells, were towed out of Cheeseman's Creek last night, *en route* for Wormley Creek. Upon arriving at the fleet, it was ascertained that the tide was beginning to ebb, and the officer detailed by me to superintend the work (Major Webb) was dissuaded by the pilot and Captain Missroon from attempting the passage. The canal-boats were therefore anchored beyond range of the enemy's guns and view, and they will be run in at eight o'clock to-night, together with the remaining mortars and 200-pounder.

April 25th, 9 P. M.—In consequence of the breaking of the blocks and falls procured from the navy, the transfer of mortars was necessarily delayed. Two 13-inch mortars and one 200-pounder gun yet remain to be trans-

shipped. Measures have been taken to procure from Fort Monroe lifting materials of adequate strength.

Six hundred 30-pounder shell and four hundred 30-pounder shot were transferred from landing to dépôt. One large sling-cart, lifting-jack, and ropes were taken to battery No. 4, in readiness for 13-inch mortars. Eight 13-inch mortars are to be brought into Wormley Creek to-night, at high-tide (eight P. M.), and will be moved up to battery No. 4 early to-morrow morning.

April 26th, 9 A. M.—Two of the barges, containing eight 13-inch mortars, were successfully taken into Wormley Creek this morning. The remaining barge, loaded with 13-inch mortar shells, is hopelessly aground, and will have to be discharged, and I have to request that the Engineer Department be ordered to furnish Col. Tyler with pontoons for this purpose. No change reported in any of the batteries.

April 26th, 9 P. M.—Two canal-boats containing eight 13-inch mortars and nine beds were brought into Wormley Creek, in readiness to be taken up to their position at high-tide (half-past eight to-night). Major Webb left Cheeseman's Creek at five o'clock this afternoon in charge of two canal-boats, containing two 13-inch mortars, one bed, and one 200-pounder gun with chassis, carriages, and platform. They will be brought into Wormley Creek at high-tide to-night. The following were landed from transports at Cheeseman's Landing and transported thence to dépôt: one hundred and thirty 10-inch shell; twenty-three 10-inch carcasses; seven 8-inch carcasses; one hundred and seventy 30-pounder shot; four hundred 30-pounder shell.

Battery No. 1.—Ten shells from the large gun at Yorktown and two from Gloucester Point were fired this morning at a canal-boat ashore about three hundred and fifty feet in front of the battery. Fragments of these shells struck the battery in several places. The projectile appears about 7-inch calibre and about one and a half inch thick.

Battery No. 2.—The working party asked for this morning, to complete the road in rear of the battery, did not report. The application is renewed for to-morrow, as the work is deemed to be of importance.

Batteries Nos. 3, 5, and 6.—No change.

Battery No. 4.—Preparations made for landing and mounting 13-inch mortars. The roads to and from Cheeseman's Creek are again getting bad, and require immediate attention.

April 27th, A. M.—The 200-pounder Parrott and the remaining two 13-inch mortars were successfully brought into Wormley Creek just at daybreak this morning. Great credit is due my assistant, Major Webb, for this work. It was by his energy, perseverance, and coolness during the greater portion of forty-eight hours' almost continuous labor—for nearly two hours of which he was under the enemy's fire of shot and shell—that the great difficulties attending the movement of this exceedingly heavy *matériel* were overcome.

I have given orders to Colonel Tyler (who has already entered upon the execution of them) to mount and place in position the mortars and 200-pounder. I have no change to report in any of the batteries.

April 27th, P. M.—One hundred and twenty-five bar-

rels of powder were to-day hauled from Cheeseman's Landing to the siege-dépôt. The roads to and from the landing are now so bad that it is utterly impossible to bring more than light loads over them. I earnestly request that a strong working party be detailed at once for its repairs. The road in rear of battery No. 2 is still unfinished. I beg to repeat my application of yesterday and of the day before, that a party be detailed to complete it.

April 28th.—Battery No. 1.—Platform for 200-pounder laid; chassis, upper carriage, and gun mounted.

Battery No. 2.—Gabion revetment of embrasures faced with green hides; approaches to magazine improved, and splinter-proofs constructed over entrance to same. This battery was much fired at by the enemy to-day; one shell struck in the battery and burst; no casualties.

Battery No. 3.—Platforms completed, guns placed in position, and magazine filled. Several shots were fired at this battery by the enemy; one shell struck full in the exterior slope of the parapet, and knocked out two or three feet of earth.

Battery No. 4.—Four platforms for 13-inch mortars were laid, and two mortars transferred from barge to battery.

Battery No. 5.—No change. This battery was to-day much fired at by the enemy; the firing was, however, extremely wild; the enemy being apparently uncertain of the true position of the battery.

Battery No. 6.—No change.

Battery No. 9.—This battery is not yet ready for its platforms; six 10-inch mortars and beds, fifteen plat-

forms, and seven hundred and eight shell were hauled to it from dépôt.

Cheeseman's Landing.—Four companies of First Connecticut artillery relieved by two companies Fifth New-York volunteers. The discharging of the vessel loaded with 10-inch shell was completed. The vessel on which are the 10-inch seacoast mortars, drawing so much water as to be unable to get to the wharf until high-water, no mortars were discharged.

April 29th.—*Battery No. 1.*—The mounting of the 200-pounder completed.

Battery No. 2.—Supplied with mantlets for fifteen embrasures. The work on the road continued.

Battery No. 3.—Supplied with mantlets for three embrasures.

Battery No. 4.—Four 13-inch mortars and three beds landed, and two platforms laid.

Battery No. 5.—No change.

Battery No. 6.—Six platforms for siege-guns taken up and removed to battery No. 10.

Battery No. 9.—Garrisoned by two companies of First Connecticut artillery; four 10-inch mortars, three hundred and eighty-four 10-inch shell, and materials for ten platforms hauled in.

Battery No. 10.—Garrisoned by one company of the Fifth New York. Materials were hauled in for four platforms; one platform laid, and two others partly finished.

Battery No. 11.—Garrisoned by one company Fifth New York; getting out timber and hewing the same for seacoast mortar platforms.

Cheeseman's Landing.—Platform material, 20-pounder Parrott guns, and a large quantity of shell landed.

April 30th.—*Battery No. 1.*—Opened fire at 2 o'clock p. m. with the five 100-pounders, and one 200-pounder; the fire was first directed at the wharf at Yorktown, where the enemy were busily engaged discharging six or seven schooners; the vessels were soon driven off; the enemy's large barbette gun was directed upon us at intervals of fifteen or twenty minutes; two of the 100 pounders were turned in that direction with good apparent effect; the fire of the 200-pounder was directed upon the vessels, which, after leaving Yorktown wharf, took refuge behind Gloucester Point. This fire was very effective. The enemy's fire was well directed; but the protection afforded by the battery is effectual, and their fire caused us no casualties. Battery No. 1 gives us complete control of the enemy's water-batteries and wharves, and of Gloucester. The expedition was as follows, viz.:

Solid shot—five from 200-pounder, one from 100-pounder; shell (percussion), sixteen, all from 100-pounder; shell (time-fuse), thirteen, all from 100-pounder; shell filled with Greek-fire, four.

The performance of the guns was excellent, as was also that of the iron carriages and chassis. Most of the percussion-shell failed to explode, and no observable effect was produced by the Greek-fire.

Batteries Nos. 2, 3, and 5.—No change.

Battery No. 4.—One mortar transferred from barge, and two mortars mounted and now ready for service. A third mortar was being mounted, when the blocks

broke, and further work was delayed for repairs; 315 shell were placed in the battery.

Battery No. 6.—Six 4½-inch guns removed to battery No. 10.

Battery No. 10.—Six platforms for 4½-inch guns laid, and six guns placed in position; one platform for 100-pounder hauled to the battery.

Battery No. 11.—Materials for platforms supplied.

Cheeseman's Landing.—The following material was landed: three 10-inch seacoast mortars; three 10-inch seacoast mortar-beds; four 20-pounder Parrott guns and carriages; four Whitworth guns; fifteen 13-inch shell, with Greek-fire; a quantity of platforms, implements, etc.

I beg to urge the necessity of immediate further repairs upon the road near Cheeseman's Landing, and in front of General Hooker's division (Yorktown road). It is impossible to haul heavy guns over that portion of the road.

May 1st, 1862.—*Battery No. 1.*—A few shots were fired this afternoon at Yorktown wharf, with what effect is not known, as the fog was thick. Fire at the rate of one shot per hour was maintained at this battery all night, to prevent the enemy's transports, which were driven away yesterday afternoon, from returning to discharge their freight under cover of darkness. Some of the pintle-blocks have started. Repairs will be made at once.

Battery No. 2.—No change: a working party of eighty or one hundred men is needed to complete the road.

Batteries Nos. 3 and 5.—No change.

Battery No. 4.—Two more mortars mounted; three more mortars discharged; five beds discharged, and four platforms laid.

Battery No. 6.—Six 4½-inch guns and ammunition sent to battery No. 10.

Battery No. 9.—Not yet ready for platforms, and the magazine not yet completed.

Battery No. 10.—Garrisoned by two companies of Fifth New York volunteers; six platforms laid for 4½-inch guns, and the six guns placed in position ready for service; magazine supplied with one hundred rounds per gun for six guns; one 100-pounder platform laid, and material hauled in for two more.

Battery No. 11.—Material got out of hewn timber for foundations for four 10-inch seacoast mortar platforms; magazine nearly completed.

Battery No. 12.—Garrisoned by one company Fifth New York volunteers; five 10-inch siege-mortars hauled in, and platforms for same; magazine not yet finished.

Battery No. 13.—Not yet ready for its garrison.

Battery No. 14.—Reported ready for its garrison to-night; one company First Connecticut artillery detailed, and platforms will be laid to-morrow.

Cheeseman's Landing.—Four 20-pounders, four Whitworth guns, and five platforms for 100-pounders, landed and sent up to the dépôt; four 10-inch seacoast mortars landed, and a large quantity of shot, shell, and implements sent from landing to dépôt.

May 2d, 1862.—*Battery No. 1.*—Repairs made to the platforms; sixty shot and shell fired at the enemy's

wharf and water battery, with apparent good effect; the long-range gun in the enemy's high bastion is believed to have burst.

Battery No. 2.—Mantlets put up in embrasures; one 4½-inch gun transferred to battery No. 10.

Batteries Nos. 3, 5, and 6.—No change.

Battery No. 4.—Three 13-inch mortars and three beds disembarked; four platforms laid and three mortars mounted.

Battery No. 9.—Six platforms laid; six 10-inch siege-mortars mounted.

Battery No. 10.—Three platforms for 100-pounders laid; three chassis and three carriages for 100-pounders in position.

Battery No. 11.—Four platforms for 10-inch seacoast mortars laid; ninety shell received.

Battery No. 12.—Five platforms for siege-mortars laid, and two 10-inch mortars placed in position.

Battery No. 13.—Not yet ready.

Battery No. 14.—Platforms for two 100-pounders carried into battery; three chassis and three upper carriages for ditto received.

Two 8-inch mortars, one hundred shell, and eight barrels of gunpowder, and implements and equipments for same, sent to head-quarters of General Smith.

Cheeseman's Landing.—Six chassis for 100-pounder guns, six carriages for ditto, landed and sent to dépôt. Large quantities of implements, ammunition, and ordnance-stores landed and sent to dépôt. I have again most urgently to request that a strong working-party be sent to complete the road in rear of No. 2.

May 3d, 1862.—Battery No. 1.—Thirty-four shot and shell fired at “big-gun bastion” and water-battery, with very good effect at the latter.

Battery No. 2.—Completed the setting up of the mantlets. A working-party on the road from 12 M. to 5 P. M.

Battery No. 3.—Completed setting up of mantlets; one 20-pounder platform laid, and one additional 20-pounder Parrott gun placed in position.

Battery No. 4.—This battery was entirely completed; platforms all laid and mortars all mounted at nine o'clock, A. M.; one hundred barrels of powder placed in magazine, and implements and equipments supplied. The battery is now ready for service.

Battery No. 5.—Two additional 20-pounder guns placed in position.

Battery No. 6.—Supplied with platforms and with six hundred and thirty-four 10-inch shell.

Battery No. 9.—Supplied with twenty-five barrels of powder, and implements and equipments. This battery is now ready for service.

Battery No. 10.—Laying platforms for 100-pounder, and placing chassis and carriage for ditto in position. Two badly directed shots from No. 1 dropped shells into this battery to-day, of which one exploded—fortunately, without injury to any one.

Battery No. 11.—Remaining platforms laid and ready for mortars; magazine completed; two beds and one 10-inch seacoast mortar hauled in and placed in position; one hundred more shells received; twenty-five barrels of powder placed in magazine, with implements, equip-

ments, etc. This battery will be fully ready for service in twelve hours more.

Battery No. 12.—Remaining platforms laid, and the mortars all mounted and placed in position; magazine completed and supplied with powder, fuses, implements, and equipments. This battery is now fully ready for service.

Battery No. 13.—Engineers' work not yet completed; armament, garrison, and all artillery equipment and supply in waiting. The battery can be made ready for service in six hours after the engineers turn it over to the artillery.

Battery No. 14.—Platforms laid for three 100-pounder Parrotts, and the chassis and upper carriages placed in position and mounted. The guns and ammunition will be hauled in to-day, the guns mounted to-night, and the battery will be ready for service at daylight to-morrow morning.

May 4th, 1862.—The enemy evacuated the place during the night, and the United States troops took possession at daylight.

The difficulties attending the placing in position the unusually heavy machinery used in this siege, were very much increased by the peculiarities of the soil, and by the continuance of heavy rains during the greater portion of the operations. Oftentimes the heavier guns, in their transportation of three miles from the landing to the batteries, would sink in the quicksands to the axletrees of their travelling carriages.

The efforts of the best trained and heaviest of the horses of the artillery reserve were of no avail in the

attempts to extricate them, and it became necessary to haul this heavy metal by *hand*, the cannoneers working knee-deep in mud and water. In these labors the officers and men of the First Connecticut artillery and Fifth New York volunteers exhibited extraordinary perseverance, alacrity, and cheerfulness. It finally became necessary to construct a heavy corduroy road, wide enough for teams to pass each other, the whole distance from the landing to the dépôt.

Whenever it was practicable to use horses, they were promptly supplied by Colonel Hunt, from the batteries of the artillery reserve under his command.

At the suggestion of Major-General McClellan, a number of rope mantlets, on the plan of those used by the Russians at Sebastopol, were constructed in New York, under the supervision of Colonel Delafield, and were forwarded to me with great despatch. They were placed in the embrasures of batteries 2 and 3, and would doubtless have fully answered the same good purpose which those of similar construction did at Sebastopol.

Although all of the batteries but two (and they required but six hours more to be completed) were fully ready for service when the enemy evacuated his works, circumstances permitted fire to be opened only from battery No. 1.

The ease with which the 200- and 100-pounders of this battery were worked, the extraordinary accuracy of their fire, and the since ascertained effects produced upon the enemy by it, force upon me the conviction that the fire of guns of similar calibre and power in the

other batteries, at much shorter ranges, combined with the cross-vertical fire of the 13- and 10-inch seacoast mortars, would have compelled the enemy to surrender or abandon his works in less than twelve hours.

It will always be a source of great professional disappointment to me that the enemy, by his premature and hasty abandonment of his defensive line, deprived the artillery of the army of the Potomac of the opportunity of exhibiting the superior power and efficiency of the unusually heavy metal used in this siege, and of reaping the honor and just reward of their unceasing labors, day and night, for nearly one month.

In conclusion, I beg to present the names of Colonel Tyler, Majors Kellogg, Hemmingway, and Trumbull, and Captains Perkins and Burke, First Connecticut artillery; Major Alexander Doull, Second New York artillery; Colonel Warren, Lieutenant-Colonel Duryea, Major Hull, and Captain Winslow, Fifth New York volunteers, as conspicuous for intelligence, energy, and good conduct under fire.

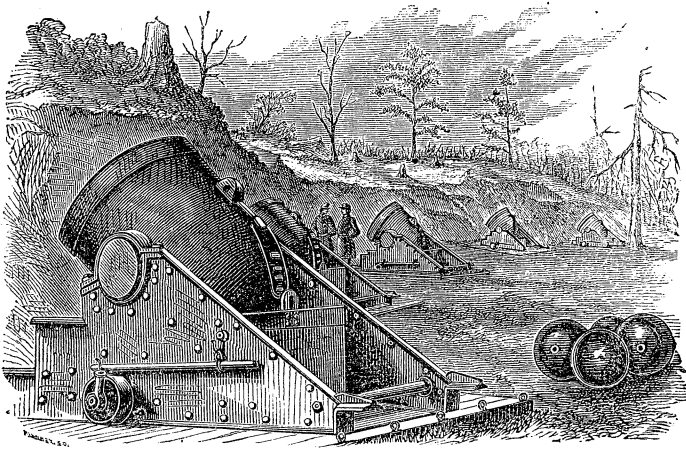
My assistant, Major Webb (Captain Eleventh United States infantry), and my aides-dé-camp, First Lieutenant John E. Marshall, Second New York artillery, and First Lieutenant A. G. Verplanck, Sixty-fifth regiment New York volunteers, carried my orders day and night, frequently under fire, with promptness and good judgment. The conduct of Major Webb, in running the 13-inch seacoast mortars, with their material and ammunition, into the mouth of Wormley Creek, under the fire of the enemy, was particularly conspicuous for perseverance, and great coolness and gallantry.

The services of several artillery officers were valuably employed in superintending the construction of gun and mortar batteries, magazines, splinter-proofs, traverses, fascines, and gabions. As they were under the exclusive orders of General Barnard, Chief Engineer, I leave it for him to bring their names and services to the notice of the Major-General Commanding.

I am, General, very respectfully, your obdt. servt.,

WILLIAM F. BARRY,

Brigadier-General, Chief of Artillery.



Battery No. 4, near Yorktown.

GENERAL J. G. BARNARD'S REPORT—No. II.

OF ENGINEERING OPERATIONS AT THE SIEGE OF YORKTOWN,
APRIL, 1862.

CAMP NEAR YORKTOWN, VA.

May 6th, 1862.

General J. G. TOTTEN,
Chief Engineer, Washington, D. C.

SIR :—The accompanying drawing (Map No. 2) gives with accuracy the outline and armament of the fortifications of Yorktown proper, with the detached works immediately connected therewith (Map No. 3). The general outline is almost the same as that of the British works in the Revolution; the *trucé* is somewhat different. The profile is everywhere respectable. The three bastioned fronts looking towards our approaches appear to have been earliest built, and have about 15' thickness of parapet and 8' to 10' depth of ditch, the width varying much, but never being less at top of counterscarp than 15ft: I should think generally much more.

The works extending around the town, from the western salient of fronts just mentioned, appear to have been finished during the past winter and spring.

They have formidable profiles, 18' thickness of parapet, and generally 10' depth of ditch. The water-batteries had generally eighteen feet parapet, the guns

en barbette. They were (as well as the works mentioned) carefully constructed, with well-made sod revetments. There were numerous traverses between the guns, and ample magazines,—how sufficient in bomb-proof qualities, I am unable to say.

The water-batteries were as follows :

No. 1.	5	8-inch Columbiads.	
" 2.	4	8 " "	
" 3. }	5	32's.	
	1	32, Navy.	
" 4.	3	32's (1827).	
" 5.	2	32's.	
" 6. }	3	9-inch Dahlgrens.	
	1	10 " "	
" 7. }	on beach 3	8-inch Columbiads, }	besides a 42-pdr. carronade
	1	64-pounder, }	intended to sweep the shore.

The first two guns of the works on the heights bore upon the water as well as the land, and were of heavy calibre. The guns in position on the fronts of attack (the first two of which bore on the water) were as follows, commencing on the left. (See the list herewith, which gives all the guns in position, or for which there were emplacements.) The emplacements were all occupied before the evacuation by siege-guns, rifled four and a half-inch guns, 24-pounders, and 18-pounders.

In Fort Magruder (the first exterior work) there were found one 8-inch Columbiad, one 42-pounder, and one 8-inch siege howitzer—the two former *en barbette*. The sketch will show the emplacements for guns on field or siege carriages, making, I think, with the foregoing, twenty-two. Two of these were placed behind traverses.

with embrasures covered by blindages. The two external redoubts, with the connecting parapets, formed a reëntrant with the fronts of attack, and all the guns bore on our approaches.

It will be seen, therefore, that our approaches were swept by the fire of at least forty-nine guns, nearly all of which were heavy, and many of them the most formidable guns known; besides that two-thirds of the guns of the water-batteries, and all the guns of Gloucester, bore on our right batteries, though under disadvantageous circumstances. Besides the above, there were emplacements for four or five guns in the intrenchments running from Yorktown towards Fort Magruder. The guns on barbette carriages had not any protection, except that in a few cases sand-bags had been piled up.

It is supposed that they awaited further indications as to the localities of our batteries before constructing merlons. For the guns on ship or siege carriages some arrangements had been made for protection by building up sodded merlons, or by sand-bags and cotton-bales; but, as they were, they would have been very inefficient against our fire.

The ravine behind which the left of the Yorktown fronts of attack was placed was not very difficult, and its head formed depressions in front of their left, imperfectly seen by their fires, and from which access could be had to the ditches; but we could not be sure of the fact before the evacuation. The enemy held, by means of a slight breastwork and rifle trenches, a position in advance of the heads of these ravines as far forward as the "Burnt House."

Our own rifle trenches were advanced to within sixty yards of the "Burnt House," a point from which, the day before the evacuation, I made my last reconnoissance.

Owing, however, to the fact that the enemy's riflemen were better concealed by shrubbery, &c., than our own, our men, who had just constructed their trench the night before, did not dare to show their heads or use their rifles, and I was unable to examine the ground in front.

The ravines which head between the Yorktown fortifications and exterior works are deep and intricate. They were tolerably well seen, however, by the works which run westwardly from the Yorktown works, and which were too numerous and complicated to be traced on paper.

Fort Magruder, the first lunette on our left, appears to have been built at an early period—probably before the town of Yorktown was enclosed—and to prevent the approach of an enemy who should attempt to pass the ravines. It had a moderately strong profile, but its gorge (a mere stockade) was taken in reverse by our battery No. 13.

The red redoubt (square), further to the left, answered very well as a means of continuing the line, and securing against assault by ordinary means; but its front was almost wholly occupied by barbettes for field or siege guns, and its interior was seen from our battery No. 13.

The extreme connection between this work was first a rifle trench, probably afterwards enlarged into a par-

apet with external ditch, and an emplacement for four guns in or near the small redan in the centre. Behind this they had constructed numerous epaulements with connecting boyaux, not fully arranged for infantry fires, and mainly intended, probably, to protect their camps and reserves against the destructive effects of our artillery.

From the "Red Redoubt," these trenches and epaulements ran to the woods and rivulet which forms a head of the Warwick, and continue almost without break to connect with the works at Wynn's Mill. This stream mentioned, whatever be its name (the term "Warwick," according to some, applying only to the tidal channel from the James River, up as high as "Lee's Mill"), is inundated by a number of dams, from near where its head is crossed by the epaulements mentioned down to Lee's Mill. Below Lee's Mill, the Warwick follows a tortuous course through salt marshes of 200 or 300 yards in width, from which the land rises up boldly to a height of thirty or forty feet.

The first group of works is at "Wynn's Mill," where there is a dam and bridge. The next is to guard another dam between Wynn's and Lee's Mill (this is the point attacked by General Smith on the 16th ult.; his object was merely to prevent the further construction of works, and to feel the strength of the position).

A work, of what extent is not now known, was at the sharp angle of the stream just above Lee's Mill, and a powerful group of works was at Lee's Mill, where there was also a dam and bridge.

From Lee's Mill a line of works extends across Mulberry Island (or is supposed to do so).

At Southall's Landing is another formidable group of works, and from here too they extend, apparently, across to the James. These groups of field-works were connected by rifle-pits, trenches, or parapets, for nearly the whole distance.

They are far more extensive than may be supposed from the mention of them I make, and every kind of obstruction the country offered, such as abatis, marsh, inundation, &c., was skilfully used. The line is certainly one of the most extensive known to modern times.

The country on both sides of the Warwick, from near Yorktown down, is a dense forest with few clearings. It was swampy, and the roads impassable during the heavy rains we have continually had, except where our own labors had corduroyed them. If we could have broken the enemy's line across the isthmus we could have invested Yorktown, and it must, with its garrison, have soon fallen into our hands. It was not deemed practicable, considering the strength of that line, and the difficulty of handling our forces (owing to the impracticable character of the country), to do so.

If we could take Yorktown, or drive the enemy out of Yorktown, the enemy's lines were no longer tenable. This we could do by siege operations, and the result was in my mind a *certainty*. It was deemed too hazardous to attempt the reduction of the place by assault.

The operations of the siege required extensive preparations; and the landing and bringing up of siege artillery, by roads which we had to corduroy throughout

their whole extent, were themselves heavy operations. The position of Wormley Creek, with its numerous wooded ravines which head near Yorktown (1,500 yards; at that distance there was everywhere good cover in them), offered great facilities for siege operations, while it, at the same time, demanded great preliminary labor. Numerous bridges had to be built, and roads prepared along the margin of the creek and up the ravines.

Nearly 5,000 yards of road, mostly side cutting, with numerous crib-work bridges over intersecting ravines, were constructed.

The "Mill-dam" was widened for vehicles, and a crib-work bridge built at the "Old dam." Three pontoon bridges, two long crib-work bridges, one floating raft bridge, were constructed lower down (though not all maintained), and other bridges were in construction towards the mouth and over the South Branch.

This preliminary work was so far completed on the 17th of April that it was deemed practicable to commence the construction of batteries, and the following were decided on:

Battery No. 1.—Five 100 and one 200-pounder Parrotts, at Farnhalt's house.

Battery No. 2.—Fifteen guns—4½, 30, and 20-pounders—1,500 yards from redoubt; 2,000 yards from Big Gun.

Battery No. 3.—Six guns—20-pounder Parrotts,—1,900 yards from redoubt.

Battery No. 4.—Ten 13-inch mortars. Moor's plateau.

Battery No. 5.—Four 20-pounder Parrotts, near War-

wick road. N. B. Six 20-pounders were put in the battery.

Batteries Nos. 1 and 2 were immediately commenced and finished, essentially finished, in three days. No. 3 was commenced, but its construction was retarded by circumstances unnecessary to explain. The sites of Nos. 4 and 5 were not definitely fixed until two or three days later, and another battery, No. 6, for six 4½-inch ordnance rifled guns, was determined upon. Portions of parallel connecting Nos. 2 and 3, and from the left of Yorktown road to No. 5, were commenced in the edge of the woods by daylight on the 25th. The same night a parallel was run through the open ground from No. 3, to connect with those portions just mentioned, and carried to a depth of four feet and a width of six feet, affording good cover.

The same night a portion of parallel was commenced from near the point marked on the map as redoubt "C," to near the head of the ravine towards the York River, and carried to dimensions to afford cover.

On the night of the 27th, a parallel was run across from the head of ravine, in one night, to the York River (or rather to the edge of the bluff); and on the night of the 29th, a branch or boyau was run from this to a point 200 yards more advanced on the bluff, from which the whole area between us and the fortress was seen; the gorge of the first redoubt taken in reverse, and the red redoubt plunged into.

I have not time to enter into the details of works and batteries, but will simply state that battery No. 6 was changed into a battery for five seacoast mortars; bat-

tery No. 5 enlarged to contain eight twenty-pounders; and battery No. 3 enlarged to contain seven twenty-pounder Parrotts.

Batteries 7 and 8, for six 20-pounder Parrotts each, were built to operate on the works at Wynn's Mill.

Battery No. 9, for ten 10-inch siege mortars.

Battery No. 10, for three 100-pounder Parrotts; seven 4½-inch ordnance.

Battery No. 11, for five 10-inch seacoast mortars.

Battery No. 12, for five 10-inch and five 8-inch siege mortars.

Battery No. 13, for seven 30-pounder Parrotts, directed at the redoubts at Yorktown works and outer batteries, and capable of being used on Gloucester.

No. 14, three 100-pounder Parrotts and one 100-pounder James, to operate on Yorktown water-batteries and Gloucester. Another 200-pounder Parrott was added to battery No. 1.

Redoubts "A" and "B" for strengthening our lines were finished, redoubt "C" well advanced, and redoubt "D" just commenced, on the night of May 3d. A parallel had been run from redoubt "A" to battery No. 5; obstructions and portions of parallel from redoubt "A" to batteries 7 and 8. The foregoing applies to the *state* of the works on May 3d, not to the particular time at which they were finished.

A battery for two eight-inch siege howitzers was being commenced in a clearing south of the Wynn's Mill works, to enfilade that position, and two eight-inch mortars were to be put in position to operate on the works in front of General Smith's position.

On the night of May 3d, all the batteries were armed (*i. e.*, contained their armament), except three 100-pounders in No. 10, seven Parrott guns in No. 13, four 100-pounders in No. 14, and part of the seacoast and siege ten and eight-inch mortars were yet to be placed in battery. All would have been ready on the night of the 5th, and the fire would have been opened on Tuesday morning.

The water-batteries would have been enfiladed by batteries Nos. 13, and 14, while they were in the direct line to receive all the shots of No. 10, which passed over the front of the work, and indeed No. 2 as well.

The gunboats would have engaged and run past the water-batteries, and opened fire upon the rear of the town, and enfiladed the ravine, over the outlet of which the road from Yorktown to Williamsburg passed.

When the number of our mortars and guns is considered, the great security with which they would have been worked (owing to their careful construction and the mantlets provided for the embrasures), the positions which Nos. 1, 10, 13, and 14 occupied, the co-operation of the navy, &c., it will be admitted, I think, that the enemy's position had become untenable; that he could not have endured our fire for six hours.

It should be mentioned that battery No. 1 was opened on the 1st, and with great effect, on the wharf (where the enemy appeared to be receiving artillery and stores) and the town.

During the first opening of our parallel, but little effort was made by the enemy to interfere with our work by his fire; but after opening the parallel between

the ravine and York River, an incessant fire was kept up during the day with rifled projectiles, eight-inch shell and solid shot, and thirty-two and forty-two-pounder shot, without retarding the work in the least, or causing material loss of life. It is also a matter of surprise, that since our first appearance before Yorktown (April 5), and particularly since the 15th, the ravines have been filled with men night and day, making roads, building batteries, parallels, and guarding the works, the loss of life has been most trifling. I have not the exact number, but I have reason to believe that it does not amount to a dozen.

I can hardly conceive that the enemy should not have known how to use his curved fires with more effect upon those ravines. There was probably no very great supply of ammunition, and that was reserved for warmer works. His fire for the last two or three days, however, was pretty brisk.

During the siege operations, Gen. Woodbury with his brigade had been mainly engaged on the construction of roads and bridges, making gabions and fascines, and constructing battery No. 4 (13-inch mortars). Capt. Duane, with his command, and Lieuts. Comstock and McAlester, have superintended the siege-works. All these officers have exhibited great energy, industry, and courage, and will be favorably mentioned by the Commanding General, as also my aide-de-camp, Lieut. N. L. Abbot, Topographical Engineers, who has done most valuable service in the reconnoissances and determination of the position of the enemy and of our own works.

Although it is next to impossible to fix by reconnoissance the exact *trucé* of field-works, our plans prove to be quite accurate, and the position of every one of the enemy's guns bearing on us was marked.

Capt. Stewart and Lieut. Farquhar have been at General Sumner's head-quarters, engaged in examining the enemy's positions along the Warwick, in strengthening our own, and in constructing batteries Nos. 7 and 8. Had the siege continued further they would have been brought to the front.

I should mention that besides the siege-works mentioned, extensive *boyaux* of communication were made down the peninsula, between the York River and Wormley's Creek, as shown on the siege plan.

I should remark that the *bateaux* bridge equipage, constructed during the last winter, has proved of infinite service, and I believe it is the only reliable military bridge. Such equipages as the India-rubber, or even the Russian canvas boat bridge, are of very limited applicability.

I send herewith four maps, viz:

Map 1.—Siege plan.

Map 2.—Plan of Yorktown and Gloucester—works taken after our occupation. (It must be borne in mind that there is a difference in the scale.)

Map 3.—Plan of external work immediately connected with Yorktown.

Map 4.—General topography and delineation of the enemy's line across the peninsula.

I regret that there is not time and means to prepare a complete plan of this enormous system of defences.

They should form part of the record of the operations of the Army of the Potomac.

The forcing of such a line with so little loss, is, in itself, an exploit less brilliant, perhaps, but more worthy of study, than would have been a murderous assault, even if it had proved successful.

I am, most respectfully,

Your most obedient,

(Signed)

J. G. BARNARD,

Brigadier-General and Chief Engineer, A. P.

P. S.—I also send a Report of “Guns and emplacements for guns in the Fortress of Yorktown,” and a “Report of First Lieut. C. P. Comstock, U. S. Engineers, accompanying his sketch of fortifications at Gloucester.”

JOURNAL OF THE SIEGE OF YORKTOWN.

APRIL 5TH TO MAY 5TH, 1862.

Saturday, April 5th, 1862.—The head-quarters of the army reached — Church about one o'clock. General Heintzelman joined us. The Chief Engineer accompanied him to front, and examined the enemy's lines.

Sunday, 6th.—The Chief Engineer went up to front with Lieutenant McAlester and reconnoitred ravines in front of Yorktown, and gave general instructions to Lieutenant Merrill to reconnoitre Warwick river to connect with Lieutenant Comstock—to Comstock to reconnoitre from Wynn's Mill down to connect with Merrill—to Lieutenant McAlester to reconnoitre works in front—also to Lieutenant Abbot to survey ravines.

Monday, 7th.—The Chief Engineer accompanied the Commanding General to examine the enemy's position along Warwick River, from Southell's Landing down. Instructed Lieutenant Comstock to repair to General Keyes's head-quarters, and continue the various reconnoissances up to Wynn's Mill. Lieutenant Abbot reconnoitred front of Yorktown Fort.

Tuesday, 8th.—Engineers employed in the reconnoissances mentioned.

Wednesday, 9th.—Lieutenant Comstock, temporarily with General Keyes, reconnoitring from Wynn's Mill down, to connect with Merrill's reconnoissance.

Lieutenant Merrill with Keyes reconnoitring Warwick River from Lee's Mill down. Lieutenant McAlester reconnoitring from left of Yorktown road to Wynn's Mill. Captain Duane and command at Ship Point. In company with the Commanding General, reconnoitred in the rain the front of Yorktown.

Thursday, 10th.—Engineers employed as before. Captain Duane came in with his command (leaving ten men at Ship Point) to look out for engineer property. Lieutenant Abbot obtained very satisfactory reconnoissance of Yorktown lines. The Chief Engineer selected an engineer and artillery dépôt in company with the Chief of Artillery, and examined the road between Cheeseman's and Back Creeks. Examined the Yorktown and Gloucester shore and works from Fairhole's house.

Friday, 11th.—Captain Duane and command to move down to Engineer dépôt and make arrangements for getting up bridge equipage and engineer *matériel* and tools.

Lieutenant McAlester was directed last night to push reconnoissances to two points especially mentioned 1st, as to the practicability of attacking the position of Wynn's Mill, by enfilading batteries near fork of roads, and by direct batteries in front, and cutting the dams; 2d, as to batteries on the knoll and the parallel there, and on the left.

Saturday, 12th. Lieutenant Comstock finished his

connoissance and report of the reconnoissance of Warwick River.

Lieutenant McAlester was engaged in examining for batteries, and observing enemy's works.

Lieutenant Merrill with General Keyes's corps, in conjunction with Lieutenant Bowen, Topographical Engineers, reconnoitring the Warwick River.

Captain Duane with the regular engineer companies examining the branches of Wormley Creek, for roads and bridges. His troops making gabions, &c.

Sunday, 13th.—Lieutenant Comstock surveying ravines in front of Yorktown.

McAlester reconnoitring as before.

Merrill remapping his reconnoissance.

Captain Duane and command as before.

Lieutenant Babcock, working under direction of Lieutenant McAlester, made an examination of Wynn's Mill position. (See report.)

General Woodbury reported with his command, and was directed to move near Engineer dépôt.

Monday, 14th.—Lieutenant Comstock surveying ravines. Lieutenant McAlester examining for roads. Lieutenant Merrill came in with Lieutenant Bowen, with the maps of reconnoissance; he was instructed to lay before General Smith the views of the Commanding General in reference to certain points, and make such further examinations as he might think necessary.

By Special Order 108, head-quarters A. P., Colonel Alexander, assisted by Lieutenant McAlester, was charged with the direction of road-making in ravines

north of Wormley Creek, General Hamilton's division furnishing the working parties.

General Woodbury was charged with roads and bridges between the two arms of the creek, and south of the southern one.

Tuesday, 15th.—General Woodbury and his command supposed to be opening roads, and establishing bridges, and making gabions.

Captain Duane with regular engineer companies on same duties.

Colonel Alexander charged by Special Order No. — with laying and superintending roads south of Wormley Creek.

Colonel Alexander was employed in assigning and making arrangements for beginning his portion of the roads.

Lieutenant Comstock engaged in surveying ravines in front of Yorktown.

Lieutenant McAlester assisting Colonel Alexander in discharge of the duties assigned him by Special Order No. —. Lieutenant Merrill came in from General Smith's with information and message, which was laid verbally before the Commanding General.

Lieutenant N. J. Hall, assigned duty under my orders, by Special Order No. —, was directed to examine the works of Yorktown, to see how far they can be identified with old works.

Lieutenant Abbot engaged in making up his reconnoissance of preceding days.

Wednesday, 16th.—General Woodbury is supposed to have been engaged yesterday in opening the roads

between the two arms of Wormley Creek, and in building bridges. Part of his command are understood to be making gabions and fascines, and part at work at the bridges and roads. Colonel Alexander, assisted by Lieutenant McAlester, commenced roads on the north bank of Wormley's. No report received of the exact progress; great delay was incurred from want of tools.

Lieutenant Comstock was engaged in exploring the ravines for batteries.

Lieutenant Merrill accompanied General Smith's command in its operations against the one-gun battery, and is understood to have been severely wounded in the arm.

Lieutenant Abbot was engaged part of the day in making up his maps, and was ordered in the afternoon to proceed to Gorman's position, where the cannonading against Wynn's Mill batteries took place, to throw up epaulements for field artillery.

Finding no tools in the division, he returned to the dépôt, where he succeeded in getting enough for 400 or 500 men. On arriving, no troops were found at the locality, and the locality of General Gorman's headquarters was not known.

Lieutenant Abbot then proceeded to General Hamilton's division, and succeeded in obtaining working parties for two batteries, which were laid out. Enough work was done to afford a thin cover.

Lieutenant Abbot being ill, Lieutenant Babcock relieved him at 10 A. M.

There is great difficulty about tools, which I know not how to remedy. Tools are issued by the Quartermaster to troops, but there are not statements of how

many are in any division or brigade. The demand for them for roads has prevented the collection of any dépôt. [The Quarter-master of each division or brigade should report how many there are in the command, and the Chief Quarter-master should establish a central dépôt near Heintzelman's head-quarters, and place an officer in charge of it, and see to the return of tools not intended to be permanently issued.]

Thursday, April 17th.—The reconnoissances show that the different batteries of the works of Yorktown contain about as follows, empty embrasures being counted as guns :

GUNS VISIBLE ON ENEMY'S LINES.

Bluff Battery, No. 1 (nearest wharf).....	5 guns.
“ “ No. 2.....	3 “
“ “ No. 3.....	3 “
“ “ No. 4.....	4 “
“ “ No. 5.....	4 “
Embrasure, No. 6.....	4 “
In lower water-battery, Commander Missroon says he saw 8	“
(I saw two, and sand-bag embrasures for 4 more) —	31 “
On main lines, the “big gun” and its companion bear on	
the water.....	2 “
	<hr/> 33 “

Of these guns, there can be directed at the proposed battery at Moore's house—

Guns of No. 1.....	5	} Certain.
“ “ 3.....	3	
“ of water-battery.....	2	
“ “ No. 2.....	4	} Probable.
“ “ “ 4.....	3	
“ “ “ 5.....	4	
“ on main lines.....	2	
Certain 10—Probable 13—Total 23.		

NOTE.—The Gloucester batteries, several of the water-batteries, say four, and the water-bearing guns of the

upper work, would bear on the extremity of this battery at two and two and a quarter miles. Commodore Missroon says he saw fifteen of the latter. I saw the same day but four or five from Moore's.

A traverse would protect the extremity. There is 200 feet of space, and allowing 25 feet on edge of bluff for howitzers, would leave 175 feet, which, spaced at $17\frac{1}{2}$ feet, would give 10 guns; and at 15 feet, 12 guns.

GUNS ON LAND FRONTS THAT I HAVE SEEN; THE "BIG" RIFLED GUN AND ITS COMPANION ALREADY COUNTED IN WATER-BEARING GUNS.

			Embrasure. Barbette. Barbette.			
				(Heavy.)	(Field.)	
Front No. 1.	East flank	} N. B. The big gun is 1	0	0	1	
" "	Curtain		on the west sa- 0	0	2	2
" "	West Face		lient of this front. 1	0	0	1
" "	2. East face	} Very doubtful about division of these faces, or whether these are two.	0	1	0	1
" "	Curtain		1	0	1	2
" "	West salient		0	1	0	1
" "	3. Curtain		1	0	3	4
" "	E. shoulder angle		0	1	0	1
" "	East face		1	0	0	1
" "	Salient		0	1	0	1
Total of land fronts			5	4	6	15
Add the two rifle-guns (counted as water-bearing)						2
						17

TOTAL GUNS BEARING ON APPROACHES, SO FAR AS YET SEEN.

Guns of Detached works.	Field.	Heavy.
In "White Redoubt," 1st (barbette)	4	1
In Redan, in centre	4	0
In "Red Redoubt"	4	1 32-lb. howitz.
	12	2—14

LOCATIONS OF BATTERIES.

At a conference, consisting of the Commanding General, Brigadier-General Fitz-John Porter, Brigadier-General W. F. Barry, Chief of Artillery, and the Chief Engineer, it was decided to locate immediately batteries as follows:

Battery No. 1.	5	100-pdr. Parrotts	}	At Farenholt's house.
" " "	1	200 " "		
" " "	2.	15 guns (4½-inch,	}	1,500 yards from red redoubt.
		and 30 and 20 pounders)		
				2,000 " " "Big Gun."
Battery No. 3.	6	guns (20-pdr. Parrotts),	1,900 yards from red redoubt.	
" " "	4.	(10 13-in. mortars),	Moore's Plateau.	
" " "	5.	(4 20-pdr. Parrotts),	near Warwick road.	

(N. B. Six 20-pounders were put in this battery.)

The operations of the day have been the same as on the preceding one.

Friday, April 18th.—During the day the batteries above mentioned were marked out; Nos. 1, 2, 3, and 5, by Captain Duane, assisted by Lieutenant Comstock and Lieutenant Babcock. No. 4—the location was selected by General Woodbury.

Battery 1 was completed so far as to afford shelter for the men. Battery 2 had not much progress made during the night, owing to the obstructions of water and reluctance of men to work.

Battery 3 was carried up sufficiently to afford shelter to men. It is not known whether battery 5 was commenced. It was laid out by Lieutenant Comstock, and an effort made by him to obtain a working party.

General Woodbury reports three bridges over Wormley Creek finished, and roads leading to them nearly ready. 651 gabions made yesterday, making a total of 1,495.

Colonel Alexander reports the roads on left bank of Wormley's Creek so far forwarded that they will be open throughout in another day. He was working 2,185 men.

Saturday, April 19th, 1862.—General Woodbury reports 922 gabions made, making a total of 2,102, but as the General himself was called away, no particular re-

port of bridges and roads was made. Same remarks as to Colonel Alexander.

Roads and bridges are believed to be so far advanced as to render siege operations practicable.

Captain Duane reports as follows (Report dated April 19th, 1862):

"The state of the batteries under my charge now in construction:

"*Battery No. 1.*—This battery was begun last night at 8 P. M., and the parapet is now essentially completed; the magazine framing is in position, and ready to be covered with earth; platforms are in readiness to be put down, and this work will be begun at once.

"*Battery No. 2.*—This was begun at 9 P. M. of the 18th, but owing to the detail of working parties not being continuous, and the men idle, the progress has been unsatisfactory; no fascines or gabions have been supplied, thus causing further delay.

"*Battery No. 3.*—Begun at 9 P. M. of the 18th; lower tier of gabions placed, and earth raised somewhat higher than their tops before daylight. Some gabions of second tier placed; no fascines were furnished, and the supply of gabions was insufficient. Men did not work well; no working party to-day."

"*Battery No. 6.*—(Corner of Warwick and Yorktown roads.) Begun at 12 P. M. of the 18th, and the men worked well; parapet about at height of sole of embrasure; no gabions or fascines furnished, and no working party to-day.

Sunday, 20th.— * * * *Battery No. 1* reported essentially finished; magazines made; some finishing-

off work to be done; the artillery laying platforms and mounting guns.

Battery No. 2.— * * * Well advanced; both tiers of gabions up; excavation of magazine commenced; in readiness for commencing gun platforms.

Battery No. 3.— * * * Epaulements with one tier of gabion revetments thrown up during the night; work prevented during the day, by its occupation by an artillery company.

Battery No. 4.— * * * Position selected in ravine leading from Wormley Creek to Moore's house, to be commenced on the morning of the 21st.

Battery No. 5.— * * * Site selected, to be commenced on the morning of the 21st.

Battery No. 6.— * * * An epaulement thrown up, but the work did not progress satisfactorily during the night, nor did the working parties during the day get on till a late hour.

Batteries Nos. 7 and 8.— * * * No report as to their condition. The report of General Woodbury is received. He has 396 men employed in making gabions and fascines. 1,962 of the former have been made; 1,180 have been delivered, and 782 remain on hand. Four officers of the 50th New York volunteers are employed in superintending road-making on the north side of Wormley Creek, above the upper pontoon bridge. General Woodbury reports three pontoon bridges, one crib bridge, and one floating bridge over the west branch of Wormley Creek, besides the mill-dam and bridge above. The abutments of one other bridge are complete; the roads well advanced. Trestle bridge on south branch

of Wormley, near its mouth, under way, but will not be completed for some days. Any cannon required for the next few days must be taken round the old road.

Colonel Alexander reports for the 19th and 20th; refers to the work upon the roads in the vicinity of the mill-dam, leading from the bridges below to the mill, and from the mill up the two branches of the creek to the batteries. On the 19th very good progress was made on these roads. Colonel Alexander states that the men worked well, but their officers do not attach sufficient importance to the work to be performed—many of them lying under the shade in place of superintending the working parties. He suggests that an order from general head-quarters, addressed to officers with working parties, might do some good. The number of men on these works is 2,817, and 122 officers, on the 19th (on the 20th, 2,188 men and 95 officers). Fair progress was made yesterday, notwithstanding the inclemency of the weather. The roads from the mill to the batteries, or as far as they are laid out, may be completed to-morrow (21st), with the exception of covering the bridges. The work below the mill is much heavier than was anticipated, and will take more time. General Woodbury says he is sadly in want of wheel-barrows. Lieutenant McAlester was in charge of the works from 12 m., on the 19th, till the date of this report, and Lieutenant McAlester reports more details of the work, and also states that the work is delayed by the lack of wheel-barrows.

Lieutenant-Colonel B. S. Alexander relieved from construction of roads, and assigned to duty at headquarters of General W. B. Franklin.

Monday, 21st, and 22d.—Captain Duane's report is for the twenty-four hours ending at 6 A. M. to-day.

He reports the condition of the batteries under his charge, as follows, viz :

No. 1. Finished with exception of traverse.

No. 2. Parapet finished, magazine constructed and partly covered.

No. 3. Very little was accomplished in this battery, the working party having been withdrawn early in the day.

Battery No. 5 was commenced and carried up to the height of soles of embrasures.

Battery No. 6. Finished, except requiring some more earth on magazine.

Battery No. 4. Commenced, and pretty well advanced.

Captain Duane says, all the working parties were withdrawn before dark, and did not return ; also that no artillery officer reported at any of the batteries, except at No. 6.

The report of General Woodbury's command states, that three hundred and ninety-four men, and thirteen officers, are making gabions, and one hundred and sixty men, and five officers, are making fascines. 890 of the former, and 887 of the latter are on hand, and at the engineer dépôt at the steam saw-mill, or in the vicinity ; also a portion near the mortar battery. The report is signed by H. W. Bowers, A. A. G.

Lieutenant McAlester reports that of the 3,000 men asked for, 2,326 reported this morning (21st) for duty on military road, with 30 commissioned officers ; 460 axemen were all employed in completing bridges, 25 men

to work the wheel-barrows in covering the bridges, and the remainder of the forces were employed with picks and shovels in trimming and draining road in east branch ravine, excavating and embanking throughout the entire extent of west branch ravine, and main ravine below the dam, and covering bridges as far as could be done without wheel-barrows. Lieutenant McAlester repeats his remark of yesterday, that the lack of a proper number of wheel-barrows essentially retards the completion of the roads.

Captain Stewart reports that he, with Lieutenant Farquhar, reported for duty to General Sumner. He and Lieutenant Farquhar went to the battery near Wynn's Mill, constructed by Captain Clark; the parapet is roughly constructed, and six platforms for guns in embrasures are down; on the right, over one hundred and fifty running feet of rifle-pit has been finished, and another commenced on its left;—about 400 men were, he believes, at work at this during the day (April 21st).⁽⁹⁾

The battery farther to the right is still more incomplete; the parapet is not quite finished, three rough platforms are down, and three embrasures without any. It was occupied by Aime's field-battery of six guns.

Wednesday, April 23d, 1862.—Battery No. 1. Finished. A second magazine for shell commenced.

Battery No. 2. The magazine finished. The terre plein graded and trees in parapet cut down.

Battery No. 3. The revetment of this battery was taken down and rebuilt during the night.

Battery No. 5. Revetment finished, magazine commenced.

Battery No. 6. Finished.

One embrasure in No. 3 was injured by the explosion of a shell, but has been repaired. 1,780 men with 63 commanding officers were employed on that portion of military roads which is under the charge of Lieutenant McAlester's Engineers, for the last 24 hours; 145 axemen employed on bridges, and the remainder, with picks, shovels, and wheel-barrows, were excavating, embanking and finishing. Considerable progress was made in covering bridges, but eight of the nine are yet incomplete. The earthwork is now in progress throughout the whole extent. About one-third of the extent remains to be finished (trimmed and drained).

Those side issues leading from left branch through secondary ravines, up to the plateau (two to the front), and one to the rear, were commenced yesterday, and will be proceeded with to-day.

General Woodbury reports 510 officers and men making gabions, &c.

Two companies employed on mortar battery No. 4, two companies employed on crib bridge, west branch Wormley, and about 160 men at work on bridge south branch. 464 gabions were made yesterday, and 203 issued; remaining on hand, 1,151; 348 fascines are on hand yet, 45 issued yesterday.

I transmit a copy of a letter received last evening from General Woodbury:

GENERAL:—I reply to yours of date, relative to sand-bags, gabions, &c.

I have the honor to state that two Engineer dépôts

have thus far been established,—one at the brigade head-quarters, and one at the steam saw-mill,—and officers appointed to take charge of them. With reference to the sand-bags,

There are at Captain Duane's camp,	12,500
At Ship Point,	90,000
Brought by steamer Thorne,	—
do. do. Thomas Swan,	11,000
	—
	113,500

A portion of these are on the way to the Engineer dépôt at this camp; the rest will be brought up to-morrow.

The schooner "Huntress" has also arrived with a cargo of intrenching tools, which will be brought to the Engineer dépôt as soon as transportation can be obtained.

Respectfully,

D. P. WOODBURY,

Brigadier-General.

Colonel J. McLeod Murphy, of the 15th Regiment New York Volunteer Engineers, reports that he with 300 men go this morning to join General Franklin, in accordance with letter A. A. G. O. of yesterday. He desired the services of Lieutenant Farrell, 15th regiment, which was granted.

The report of Captain Brainerd, 50th Regiment New York Volunteers, states, that about 200 men of the 74th New York Volunteers positively refused to work (night before last), and returned to their camp at about 9 p. m. The report is forwarded through the Adjutant-General's office.

Thursday, April 24, 1862.—General Woodbury's command has 300 men employed making gabions, fascines, &c., 133 on mortar battery (No. 4), and about 200 men employed on bridges; Colonel Murphy with 300 men on detached service; 1,098 gabions and 243 fascines remain on hand. The northern approach to the upper pontoon bridge, 1,200 feet in length, is nearly finished, and will be completed probably to-morrow.

Crib bridge, floating bridge, and middle pontoon bridge, all in working order. The crib bridge below the middle pontoon bridge will be built as soon as possible. The materials have been cut and floated to the site. Mortar battery No. 4 is made for the platforms; by to-night all will be done that can be done on the battery before the platforms arrive.

Lieutenant McAlester reports 1,668 officers and men employed on military road. The road below the dam is now complete to within about 300 yards of lower terminus, the point limiting the portion under his supervision. One branch was made leading from the main road below the dam, up to the plateau in front. The road in right branch ravine is complete except the covering of the two bridges. These, together with those on four side issues, upon the plateau in front, which were commenced yesterday, will be finished to-day. The covering of three bridges in left branch ravine, and the earthwork of the branch road leading up to the plateau in rear, are yet incomplete. This work, together with some trimming and draining on this part of the road, will be finished to-day. The roads in the two branch ravines above dam, with the secondary roads leading

up to the plateau, will therefore be completed to-day. Lieutenant McAlester doubts whether the bridge at the dam will be finished to-night.

Lieutenant Abbot, Topographical Engineers, A. D. C., was yesterday directed to inspect the roads and bridges. He reports that the road from the upper pontoon bridge to the mill, and thence up the right-hand ravine, is passable to a point where the plateau can be reached, except at three culverts, which will doubtless be done to-day. From the mill, the road up the left-hand ravine, *viâ* the old dam, up the old ravine, is completed except a space of a couple of hundred yards at the crossing of the stream, just before reaching the terminus of the old Secession road to the springs. This place ought to be completed to-day. All three roads should be rounded up in the middle, and ditched on the bluff side. I have directed this to be done.

BRIDGES. — The *Old Dam bridge* is well advanced, but will require another day's labor. The crib-work is put up and covered with brush, but the want of wheelbarrows delays the covering with dirt. Approaches good.

The *Mill-dam bridge* is unfinished. A framework of logs, and some brush covering to widen it, are completed; but much dirt must be thrown on it before it is ready for any but infantry use. One or two days at least without carts will be required. Approaches good.

Upper pontoon bridge in proper order, except a dirt covering, *very necessary* to prevent the noise of crossing artillery being made.

Frame bridge completed, except a *débouché* to the

road to the mill, on the north side of the creek. This is absolutely essential.

Raft bridge worthless, except for infantry, for want of buoyancy. A regiment has crossed it in open order. Approaches bad. 180 pontoons below raft in fine order; excellent approaches, to be covered with dirt.

Second pontoon bridge below raft. Abutments laid and approaches dug, but no bridge.

Pontoon bridge near Harris's house completed, but requires some little filling to connect the abutments with the approaches for wagons. To be covered with dirt.

Frame bridge across east branch of Wormley Creek, not more than half done; approach good on south end, but incomplete on north end. I think several days will be required to finish this bridge.

Captain Stewart reports that 300 men were working on the rifle-pits, and 200 men were employed thickening the parapet, and placing rough corduroy platforms in battery No. (7), which is still incomplete, and will require much labor; six guns are now on the rough platforms. The embrasures of No. (8) are not wholly revetted. At General Smith's position, by Garrow's, a rifle-pit has been uncovered and carried on near the waters to the right and front of the batteries, and he intends forming obstructions of abattis to the right of them in the woods.

Captain Smith reports that the enemy appears to be busy in the works opposite batteries 7 and 8, preparing embrasures of sand-bags, &c. Some eight or nine apparently in different stages of construction, and they

have, perhaps, covered their line between Garrow's and Wynn's mill with defences.

General Franklin required 100 pontoons with oars and anchors, for landing troops, and balks and chesses enough for twenty. Orders have been sent from the Adjutant-General's office, directing Colonel Ingalls to tow down such pontoons as could be spared.

Captain Stewart has been charged with the construction of batteries 7 and 8.

Friday, April 25th.—About 350 men of the Engineer brigade are employed in getting out timber for bridges on west branch of Wormley Creek; 140 men on bridge south Wormley, and 112 are employed on battery No. 4. 180 men making gabions, and 24 collecting and guarding pontoon property. Colonel Murphy with 300 men on detached service. 132 gabions made yesterday and 235 issued; 995 remaining on hand. 223 fascines on hand. The floating-bridge on west branch of Wormley Creek was taken up yesterday and transferred to the crib bridge, a few hundred yards below. This crib bridge is progressing rapidly. Some pontoons were taken from the lower pontoon bridge, to allow barges to go through.

Lieutenant McAlester reports that 1,240 men and 39 officers were engaged on military road for the 24 hours ending 6 A. M., and that the road is now ready for use. The widening of the mill-dam to a double track is not quite finished; it will be done to-day. Ample width for a single track is all done and for use. A small detail (500 to 600 men) has been applied for, to work upon dam and three additional branch roads leading from main road up to plateau.

Captain Stewart reports having examined the positions of divisions and batteries of the left of the line, under orders from General Sumner. There are three batteries at the burnt chimneys, one for six guns in embrasure just to the left and front of chimneys, connected by a covered way with one for four guns on the right and front. In the latter are four 10-pounder Parrott guns. (Neither were quite finished.) A covered way leads from this second battery to the hollow and woods on its right. Another battery for four guns, two 10-pounder Parrotts and two light 12-pounders, is also constructed. Four batteries have been constructed by General Peck, nearly in the position shown in the small tracing, which is on the scale of the map photographed by Major Humphries.

The left "Battery Couch," four guns, barbette, close to the creek, on a spur, to sweep the channel as you approach and pass the battery. Battery Harris, for four guns; in it are two 10-pounder Parrotts, but not on the platforms; connected with "Battery Couch" by a narrow covered way. Battery Keyes still masked by woods, as is Battery Couch. No guns mounted. Next, Battery Peck, for seven guns, at point; it has two 10-pounders. Battery West is under construction for seven or eight guns. The batteries seemed well placed for the object in view.

Yesterday, Lieutenant Farquhar, with 300 men, was engaged on No. 8; 100 men were making gabions for Captain Stewart. No. 7 was occupied by a battery during the day.

Batteries 1, 2, 3, 5, and 6, are completed.

A portion of first parallel was commenced yesterday, connecting batteries Nos. 2 and 5, the portions in the woods being commenced about 1 p. m., and the open part after dark.

The portions in the woods are well advanced.

On the open portion, the number of men called for by Captain Duane was not furnished; the men succeeded in getting cover, and the parallel progressing to-day.

Saturday, April 26th.—*Redoubt No. 1.*—Parapet carried to height of banquette, and the revetment commenced.

Redoubt No. 2.—Same as No. 1.

Very little work was done last night; it was impossible to get the working parties to do any thing; it was very dark and rainy. The parallel from battery No. 5 to the York road has been carried to the depth of four (4) feet, and to a width of six (6) feet, affording a good cover through from York road to battery No. 2. The trench has been carried to the depth of four (4) feet, and is from ten (10) to twelve (12) feet wide.

Lieutenant McAlester reported yesterday that he would be ready to commence mortar batteries at 10 a. m. to-day, with 200 men. He had located 10-inch siege mortar batteries for fifteen guns. He has asked for 400 men on branch roads for to-day. 107 men of General Woodbury's command were making gabions, and 594 on bridges and dock for mortar battery No. 4. 78 gabions and seven fascines were made yesterday, and 860 of the former and 180 of the latter remain on hand.

The connection between the upper crib bridge and the upper pontoon bridge (west branch Wormley) is

not complete. The lower crib bridge, on west branch Wormley, will probably be finished to-day.

General Woodbury states that he had supposed that the platform timbers of the 13-inch mortars would come with the mortars; if not, he will begin immediately to have timber for that object. I understand that platforms have come with the mortars, but that they are entirely too light for use alone, and may require a grillage or strong frame-work of some kind to support them.

The trestle bridge on the south branch of Wormley is progressing slowly, in consequence of the absence of 300 men of the 15th regiment with Colonel Murphy. This detachment includes many carpenters.

Two regiments have been detailed for instruction in making gabions, &c., to report to General Woodbury at the meeting-house near here. One has reported this morning.

Captain Stewart reports 200 men thickening the parapet and revetting No. 8 with gabions; a party of 100 men making corduroy road to battery No. 7 from Yorktown and Warwick roads, under direction of Lieutenant Farquhar, Engineers. Captain Stewart visited batteries Nos. 7 and 8, and examined the rifle-pits and batteries at Garrow's Chimneys, and the line of General Smith, between the Lee's mill roads. He consulted with General Smith respecting the defence of his line.

Sunday, April 27th.—860 men of Engineer brigade have been employed on bridges, battery No. 4, and unloading shells, and instructing troops in making gabions and fascines. One company and 300 men on detached service at Cheesman's Landing. Number of

gabions on hand, 860; of fascines, 180. One barge with mortars has been brought within fifteen feet of wharf of battery No. 4. Several cribs of crib bridge have given way. Tools for nearly ten thousand men are reported in the Engineer dépôts, mostly at dépôt in camp of Engineer brigade.

A great deal of difficulty and delay is still experienced in regulating the working parties. Details, after waiting at the place they have been directed to go, return to camp and report no engineer officer to be found, while the engineer officer reports waiting several hours for a detail without seeing them; all this, I think, could be remedied by conforming to the requirements of order No. 119, Head-Quarters Army of Potomac. The order requires that the division officer of details shall consult the engineer or artillery officer in construction daily, and shall also be responsible for tools, &c., and that the party is provided with them in proportion as desired by the constructing officer. This, too, would prevent all such occurrences as has happened this morning, viz: a detachment reporting without tools of any kind, because the officer in charge of details had none. The same order requires that this officer, when he has not sufficient tools, shall immediately make requisitions upon General Woodbury, in charge of dépôts. These delays are generally, I am forced to believe, the result of culpable neglect, and ought to be remedied.

Captain Stewart reports that a party of 200 men was employed on battery No. 8, revetting the interior slope with gabions, and that two-thirds of the battery is revetted. The weather interfered with the work.

One hundred men were also making gabions and fascines neither party worked after 3 P. M. Work at abatis, &c., was probably continued near Garrow's Chimneys, by General Smith's command. No report has been received from Captain Duane or Lieutenant McAlester this morning.

Monday, April 28th. The upper pontoon bridge over west branch of Wormley has been relaid with increased balks, and with a second layer of covering with chess. The troops of General Woodbury's command are variously employed on batteries, bridges, with pontoon property, instructing men in making gabions and fascines, and 320 men on detached service. No report of gabions and fascines made was received this morning, as the regiments at that work are supposed to have reported to the Assistant Adjutant-General, at headquarters. General Woodbury has been directed to require the reports to pass through his office, as the regiments were ordered to report to him, and this department must be informed of the material on hand, &c. 324 gabions and 180 fascines, reported as made several days ago, are being collected at the dépôt this morning. I have asked Captain Stewart about the work done in the woods, &c., from battery No. 7 to redoubt "A," also between 7 and 8. I have suggested rifle-pits with entanglements on open field between Nos. 7 and 8. I have directed Captain Stewart to protect this flank by every means possible, and consult with General Sumner upon the defences. General Woodbury has been directed to furnish such assistance to General Barry, with the 13-inch mortars, as is in his

power. To-day only 1,000 men reported in place of 1,500, to Lieutenant McAlester. He reports every thing under way.

MEMORANDUM OF BATTERIES.

BATTERY No. 9.

On left of old dam, about 1,900 yards from fortress; ten 10-inch siege mortars.

BATTERY No. 10.

In middle of parallel between "Right Branch" and York river, 1,500 yards from "Big Gun:" built for seven (7) siege-guns and three (3) 100-pounder Parrotts.

The six (6) 4½-inch guns from No. "6" will be placed in it; also one from No. "2," this last will be replaced by a 30-pounder Parrott.

BATTERY No. 11.

In head of ravine "E," 2,600 yards from fortress, 4,000 from Gloucester Point: for four (4) 10-inch seacoast mortars.

BATTERY No. 12.

Behind Secession huts, 1,700 yards from fortress, 2,000 from exterior work: for ten (10) 10-inch siege mortars.

BATTERY No. 13.

On right of boyaux to be made to-night, and near

bluff; 1,250 yards from fortress, 2,400 from exterior works, and 2,500 from Gloucester: for three 100-pounder Parrotts, three 30-pounder Parrotts; leaving four 30-pounder Parrotts to be otherwise employed.

Battery No. 6.—To be converted into a mortar battery for six (6) 10-inch seacoast mortars, an epaulement to be built to protect against Wynn's Mill, and a couple of platforms behind it, to direct mortars that way.

Battery No. 1.—To be extended to receive another 200-pounder Parrott.

Tuesday, April 29th.—Redoubt "C." 200 men are employed night and day; the ditch is now six feet deep, and about seven feet wide; it is proposed to continue the width to twelve feet, which will require twenty-four hours more, at least. The closing of the redoubt to the rear can be commenced to-morrow morning.

Parallel.—In consequence of the detail being short 500 men, little progress was made in the daytime; also the detail for the night was not filled out, and battery No. 12 was opened; in consequence the branch parallel leading from main parallel to rear, to Plum Tree ravine "L," was not opened last night; it will be opened to-night.

Battery No. 9.—The detail worked very sluggishly, and the platforms cannot be put in this morning, as was anticipated. It will be ready to-morrow.

Battery No. 11.—Has progressed rapidly, and is now ready for its platforms.

Battery No. 12.—Will be ready for its platforms to-

morrow morning. The magazine timbers ought to be delivered at all the above batteries to-day, and to-morrow the carpenters, with tools, nails, and spikes, ought to be on hand.

Parallel between battery No. "2" and Yorktown road requires widening—a berm and steps.

Parallel between ravine and York River requires steps and banquette tread.

Parallel behind battery No. 10 requires a little more excavation.

Branch parallel traced and nearly excavated.

Redoubt "B," revetment done, parapet nearly completed; will probably be done to-day.

Redoubt "A" will be completed to-day.

Battery No. 10 ready for gun platforms; one magazine complete except floor, the other under way.

Number of gabions ready, 176; on hand, 950; 276 at dépôt at saw-mill, about 400 at Methodist church, and about 250 distributed near batteries. The artillery has charge of laying the platforms and mounting the mortars in battery No. "4;" the beds for the platforms are prepared by the engineers. General Woodbury suggests that, as the mechanics employed on these beds have now experience in that line, they can be usefully employed on other mortar-beds. General Woodbury desires that the 5th New Hampshire and the 69th New York regiments be ordered to continue in the service for which they have been detailed for four more days. I respectfully request that this may be granted.

Captain Stewart reports progress on Nos. 7 and 8, and corduroy road to No. 7; also having examined the

ground along left of line ; nothing of moment to report ; enclosed is a memorandum for reference.

April 29th.—The following memorandum, changing the armament of battery No. 13, and establishing battery No. 14, is approved by the Commanding General.

Battery No. 13.—To consist of six 30-pounder Parrott guns—two on the left to be directed at the gorge of “Right redoubt,” the other four to be directed 5° north of Hospital. (A change of 15° in the direction of embrasure will bring these last four to bear on Gloucester, if necessary.)

Battery No. 14.—To consist of three 100-pounder Parrotts and one 100-pounder James gun, to be placed at extremity of old parallel—right cheek of embrasures to embrace the extreme right-hand effective gun of Gloucester Fort. Shifting embrasures 5° or 10° will bring the “big gun” and the water-batteries of Yorktown into the field.

Wednesday, April 30th, 1862.—Parallel from battery No. 2 to battery No. 5 completed, except levelling top of parapet.

Parallel leading from battery No. 5 to redoubt “A” will be completed to-day. Parallel on right completed, save a few steps, and a small portion of banquette. Redoubt “B” is essentially completed. Battery No. 10 finished, except placing dirt on magazine. Battery No. 6, changed for mortars ; will be completed to-day. Battery No. 1, extension for 200-pounder gun commenced, and will be completed to-day. Four hundred and three men of General Woodbury’s brigade are engaged on bridges, on south and west branch of Wormley Creek ; four hun-

dred and fifteen on detached service, the remainder on battery No. 4, on guard, and making gabions, &c. Three hundred and eighty-four gabions were made yesterday, and 1,370 on hand. Seven or eight hundred of these are at Methodist church. I have directed that they be collected at the saw-mill dépôt immediately. One hundred and nineteen fascines are on hand.

The bridge over the south branch of Wormley requires four more framed trestles; they will be in place to-night. The roadway covering has been delayed for want of teams, but will probably be done before the end of the week.

The lower, formerly the middle, pontoon bridge, over west branch, will be relaid to-day, with four additional balks throughout, and one additional covering of boards.

The upper pontoon bridge over the same stream is ready for the passage of siege artillery. Crib bridge may also bear heavy artillery: the communication between this bridge and the lower road along the north bank of west branch is completed, but the turn is rather abrupt for teams.

Nearly five of the foundations for platforms for battery No. 4 are laid; one magazine is complete except the door; another well advanced: the work progresses well.

General Woodbury can spare twenty more pontoons for General Franklin, who has eighty already.

Lieutenant McAlester reports as follows: * * *

Parallel.—Four hundred men were at work completing it during the day, and at night I opened, with 500 men, the branch parallel designed to communicate with Duane's parallel, at battery No. 2.

Redoubt.—Two hundred men during the daytime were widening ditch and parapet.

Battery No. 9.—Two hundred and fifty men were completing excavation and grading road leading up to it, by daylight. It will be ready for platforms and traverses at noon to-day.

Battery No. 11.—One hundred and fifty men completed excavation for battery and magazine by daylight. May complete magazine to-day.

Battery No. 12.—Two hundred men completed excavation ready for platforms, and opened road leading up to it by daylight. Magazines will be excavated to-day.

Thursday, May 1st, 1862.—The parallel under the direction of Captain Duane, on left of Wormley Creek, nearly finished; on right branch of Wormley Creek, completed. Redoubt "B" completed.

Battery No. 1.—Exterior nearly enough completed to receive armament.

Battery No. 13.—Laid out, and worked on one day and night.

Battery No. 14.—Laid out, and worked on one day and night.

General Woodbury reports 416 men on detached service, and the remainder employed on bridges, batteries, making gabions, &c. Two hundred and twenty-six gabions made yesterday, and 1,241 on hand; seventy-nine fascines are on hand.

Bridge over south branch Wormley, frame completed; if the weather will permit, it will be ready for use in two or three days.

Two double covered pontoon bridges and one good crib bridge now span the west branch of Wormley Creek. Seven foundations for mortar platforms in battery No. 4 were ready last night.

Captain Stewart reports that 195 axe-men were employed in cutting trees on the 29th ult., from redoubt "A" to battery No. 7, and from No. 7 to the clearing between 7 and 8, to form an obstruction; trees were also cleared away from front of battery No. 8. A party was also employed at night under Lieutenant Farquhar in throwing up a covered way along the road, from 7 to 8. On the 30th, a party of 800 men worked upon the pit across the clearing, between 7 and 8; 200 men also employed on No. 7; others were making fascines, making abattis, and preparing timber for magazines.

Lieutenant McAlester reports his operations for the last twenty-four hours as follows:

"Redoubt C."—The width of ditch was increased from seven to eight feet, the ramp of approach commenced, and last night the excavation for closing gorge was opened. To-morrow I hope to commence emplacements for guns.

Parallel.—The parallel has now its width of twelve feet, with some slight exceptions. Earthen banquettes are in for about one-quarter the length, and a few log ones were arranged yesterday. I think it can all be completed to-morrow night.

Road leading from Military Road to battery No. 2. The bridge across ravine half done; can be completed to-night, I think.

Battery No. 9.—Excavation ready for platforms to

be completed at 11 A. M. to-day; those for magazines probably to-night. Magazines to be put in to-morrow.

Battery No. 12.—All excavations to be complete to-night. Magazines to be put in to-morrow.

Battery No. 11.—To be finished, magazines and all, to-night.

MEMORANDUM OF BATTERIES.—(No. 2.)

The Commanding General directs the following changes in batteries:

BATTERY No. 5.—To be enlarged to receive two more 20-pdr. Parrotts, making eight in the battery.

BATTERY No. 3.—To receive one additional 20-pdr. Parrott, for which there is space already.

BATTERY No. 10.—To receive an additional siege-gun, making eight siege-guns and three 100-pdr. Parrotts.

BATTERY No. 1.—To receive the additional 200-pdr. Parrott.

These changes, with those fixed by memoranda of April 28th and 29th, will constitute the batteries as follows:

BATTERY No. 1.

Two 200-pdr. Parrotts.

Five 100 “ “

(One 200-pdr. Parrott not arrived, the others in battery.)

Distance to Gloucester Fort,	5,025 yards.
“ “ Yorktown wharf,	4,820 “
“ “ “ Big Gun,”	3,810 “

BATTERY No. 2.

Right wing, nine siege-guns (three $4\frac{1}{2}$ -inch ordnance, six 30-pdr. Parrotts). Left wing, six 20-pdr. Parrotts.

Distance to Yorktown front,	1,850 yards.
“ “ exterior redoubts,	1,800 “

BATTERY No. 3.

Seven 20-pdr. Parrotts.

Distance to exterior redoubts,	2,000 yards.
“ “ Yorktown front,	2,300 “

BATTERY No. 4.

Ten 13-inch mortars.

Distance to Gloucester Fort,	4,100 yds.	^{Bearings.} N. 28° W.
“ “ Yorktown wharf,	3,400 “	N. 43° W.
“ “ Big Gun,	2,400 “	N. 49° W.
“ “ right redoubt,	3,100 “	N. 77° W.
“ “ red redoubt,	3,360 “	N. 86° W.
“ “ works at Wynn's Mill,	4,900 “	S. 52° W.

BATTERY No. 5.

Eight 20-pdr. Parrotts.

Distance to red redoubt,	1,575 yards.
“ “ right redoubt,	2,000 “
“ “ Yorktown front,	2,800 “

BATTERY No. 6.

Five seacoast 10-inch mortars.

Distance to Gloucester Fort,	5,100 yds.	^{Bearings.} N. 3° E.
“ “ Yorktown wharf,	3,900 “	N. 5° W.
“ “ “ front,	2,775 “	North.

Distance to exterior redoubts, 2,050 " N. 32° W.
 " " Wynn's Mill w'ks, 2,500 " S. 45° W.

BATTERY No. 7.

Six 20-pdr. Parrotts (if to be had).

Distance to Wynn's Mill works, 1,125 yards.

BATTERY No. 8.

Six 20-pdr. Parrotts.

Distance to Wynn's Mill works, 1,125 yards.

BATTERY No. 9.

Ten 10-inch siege mortars.

Distance to Yorktown front,	1,910 yds.	^{Bearings.} N. 20° W.
" " exterior redoubts,	2,000	" N. 70° W.

BATTERY No. 10.

Seven siege-guns.

Three 100-pdr. Parrotts.

Distance to Gloucester Fort,	3,400 yards.
" " Yorktown wharf,	2,550 "
" " " front,	1,500 "
" " right redoubt,	2,150 "

BATTERY No. 11.

Four or five seacoast 10-inch mortars.

Distance to Gloucester Fort,	4,700 yds.	^{Bearings.} N. 9° W.
" " Yorktown wharf,	3,650	" N. 17° W.
" " " front,	2,500	" N. 18° W.
" " exterior redoubt,	2,400 yards,	Wynn's
Mills, 3,300, bearing respectively,		N.
52° W., and S. 52° W.		

BATTERY No. 12.

Ten mortars. (At present it is proposed to put in five 10-inch and five 8-inch mortars.)

		Bearings.
Distance to Yorktown front,	1,580 yds.	N. 20° W.
“ “ exterior redoubt,	1,900 “	N. 78° W.
“ “ Burnt House,	925 “	N. 9° E.

BATTERY No. 13.

Left wing, three siege-guns (30-pdr. Parrotts), directed at gorge of right redoubt.

Distance to red redoubt,	2,590 yards.
“ “ right redoubt,	2,100 yards.

Right wing, four siege-guns, directed 5° north of hospital. This wing will embrace the whole of Yorktown front, and a change of embrasures of 15° will bring it to bear on Gloucester Fort. (In all, seven 30-pdr. Parrotts.)

Distance to Big Gun,	1,250 yards.
“ “ left salient of Yorktown front,	1,625 “
“ “ Yorktown wharf,	2,300 “
“ “ Gloucester Fort,	3,100 “

BATTERY No. 14.

Three 100-pdr. Parrotts.

One 100-pdr. James.

Embrasure to be arranged to sweep from Big Gun to Gloucester Fort.

Distance to Big Gun,	1,400 yards.
“ “ Yorktown wharf,	2,450 “
“ “ Gloucester Fort,	3,150 “

May 2d, 1862.—The parallel between right and left branches of Wormley is complete, except about 100

feet of banquette and some trimming of excavation, the whole to be finished to-night or early to-morrow.

Battery No. 11.—Finished except traverse, to be put in after mounting mortars.

Batteries 9 and 12.—Complete except magazines and traverses; every effort will be made to finish them by to-morrow night.

Redoubt "C."—Ditch from 9' to 12' wide, and gorge and rampart excavations near completion. They can doubtless, with emplacements for guns, be finished by Sunday night.

Road connecting parallel across left branch ravine to be completed to-night. The one along the shore of right branch ravine commenced to-day.

Parallel between battery No. 2 and redoubt "A" needs slight changes.

Battery No. 3.—Change complete, except traverse.

Battery No. 13.—Parapet three-fourths completed; magazine commenced; magazine for reserve commenced, and excavation completed.

Captain Stewart reports parties still at work on battery No. 7, and constructing magazine for battery No. 8. Three hundred and forty-eight gabions were made yesterday, and 215 issued, leaving 1,374 on hand

The south branch bridge progresses well.

Sand-spit bridge will be commenced to-day.

Work on lower crib bridge to be resumed to-day.

But one platform foundation remained to be laid last night—in No. 4.

The magazines will probably be finished to-day.

The Commanding General authorized two 8-inch siege

mortars to be sent to General Smith, to be located near Garrow's burnt chimneys, for shelling the works in front of General Smith's position.

Captain Stewart was directed to establish a battery for two 8-inch siege howitzers in the small clearing west of General Sumner's head-quarters, to be fixed at $12^{\circ} 30'$ elevation.

To clear trees 60' high when firing at this elevation, the howitzers must be placed 270' back from the woods; if 100' high, 440' back; if fired at 5° they must be 686' in rear of trees 60' high, and 1,143' in rear of trees 100' high.

The position, according to our maps, will enfilade the Wynn's mill works, from the further extremity of which it is but about 1,800 yards, and it is but 2,000 yards from the enemy's works at the one-gun battery.

Saturday, May 3d, 1862.—Battery No. 3.—Extension completed.

Battery No. 5.—Extension for two guns; ready for platforms.

Battery No. 13.—Parapet done; extension for one gun commenced; magazine ready for earth cover.

Battery No. 14.—Revetment completed; magazine ready for cover; parapet well thickened.

Battery for Whitworth gun near No. 14, commenced.

Boyaux, 2,500 yards, 6' wide and 4' deep, commenced.

Battery for Whitworth gun near No. 5, has one row of gabions up.

Lieutenant McAlester reports that his portion of the parallel will be finished to-night, including the additional banquette decided upon last night. He reports

also, that no interest whatever in the work could be excited in the officers, and that the men were therefore generally idle. The detail from the Mozart regiment accomplished very little. Battery No. 11 is complete. Batteries Nos. 9 and 12 progressed very slowly, from a failure of carpenters and teams to report as expected. Lieutenant McAlester thinks it may possibly be completed to-night.

Two guns (Whitworth battery) located and commenced yesterday, will be ready to-morrow evening.

Infantry road up right branch ravine, commenced yesterday; will be ready finished to-day.

Redoubt "C." The enemy concentrated so heavy a fire upon it, that the working party was withdrawn at about 10 A. M. At night work was resumed upon it, but the officers and men from Hooker's division worked badly. Lieutenant McAlester thinks he will be able to finish it to-night.

Captain Stewart reports that during a part of the day a party of 100 men were employed in revetting, building traverse, and repairing battery No. 7. Two hundred men were engaged in making obstructions in its vicinity. Two hundred men were at work on No. 8.

A party of 200 men were engaged yesterday afternoon in forming the parapet of a barbette battery for two 8-inch siege howitzers in peach orchard clearing; also 100 men cutting timber in its vicinity.

General Woodbury reports 255 of his command at work on bridges over Wormley, 100 on battery No. 4, over 300 men on detached service, and the remainder variously employed. Two hundred and forty-two ga-

bions were made yesterday, and 485 issued, leaving 1,131 on hand. A large force will be employed in making fascines to-morrow.

The road-covering of bridge over south branch of Wormley is complete; the earth-covering will probably be done by Sunday night. The sand-spit pontoon bridge will, I hope, be done by Sunday night.

Sunday, May 4th, 1862.—Battery No. 8 is reported as completed; some trees were to be felled to unmask it; a mortar battery near Garrow's chimneys was being constructed; this would have been completed to-morrow.

The parallel between No. 3 and No. 5 is completed.

Battery No. 10.—One traverse and magazine to finish, and embrasures to open. No. 13, three traverses to build. No. 14, traverse to build and parapet to thicken.

Battery for Whitworth gun, interior slope to be revetted.

Battery for Whitworth guns near No. 3, parapet three-fourths done. Battery No. 5, change completed.

Redoubt "D" commenced last night. Five hundred and seventy gabions and eighty-three fascines were on hand at Engineer dépôt.

No report has been received from Lieutenant McAlester of the works under his charge.

Redoubt "C" was completed, and only a little finishing was required to be done upon the parallel and batteries between the branches of Wormley Creek.

Monday, May 5th, 1862.—The works upon the batteries, trenches, &c., were suspended on the morning of the 4th; the fortress of Yorktown and the whole line of rebel works, including the fort and batteries at

Gloucester, having been evacuated during the preceding night by the enemy. General Woodbury, with a detachment of two hundred men, was directed to proceed to Yorktown for the purpose of removing torpedoes, infernal machines, &c., left by the enemy. In the tents and houses lately occupied by the enemy were found a number of shells with percussion caps, with cords attached to explode them on being pulled. Several shells were also removed from the ground (where they were embedded) in the streets of the town, and the entrances to the fortifications and magazines. These were to be exploded by being stepped upon. Colonel Murphy still absent at Cheeseman's Landing with over 300 men.

Number of gabions made by the Engineer Brigade	
during the siege, about	4,000
Number of gabions expended during the siege,	3,400
<hr/>	
“ “ “ remaining on hand, . . .	600
<hr/>	
“ “ fascines made during the siege, about	560
“ “ “ expended, “ “	475
<hr/>	
“ “ “ on hand,	85

Lieutenant Comstock was directed to proceed to Gloucester and report, with sketches, upon the enemy's works at that place. Lieutenant Abbot, A. D. C., examined and made drawings of the fortifications enclosing the town of Yorktown; and Lieutenant Hall, artillery, furnished sketch of the “Red Redoubt” line of works. General Barnard went to the advance with General Commanding. Battle of Williamsburg.

POSITIONS OF GUNS AND EMBLACEMENTS FOR GUNS IN
THE FORTRESS OF YORKTOWN:

Beginning with Water-Battery and going round the entire main works of Yorktown, from east to west.

Water-Battery.	$\left\{ \begin{array}{l} 1 \text{ 8-inch Columbiad.} \\ 1 \text{ 64-pdr. gun.} \\ 2 \text{ 8-inch Columbiads.} \\ 1 \text{ 42-pdr. carronade.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Lower or beach battery. Two or three of} \\ \text{its guns would see our battery No. 14, per-} \\ \text{haps No. 13 also.} \end{array} \right.$
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$\left\{ \begin{array}{l} 3 \text{ 9-in. Dahlgren guns} \\ 1 \text{ 10-in. Columbiad.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Water-battery is on left flank of front of} \\ \text{attack, drawn on siege sketch with em-} \\ \text{brasures, but the embrasures had been filled} \\ \text{with guns mounted } \textit{en barbette}. \text{ The} \\ \text{10-inch Columbiad would probably have} \\ \text{borne on our battery No. 14.} \end{array} \right.$
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$\left\{ \begin{array}{l} 1 \text{ 6}\frac{1}{2}\text{-inch rifled gun (burst).} \\ 1 \text{ 9-inch Dahlgren gun, occupying place of next—i. e.} \\ 1 \text{ 6}\frac{1}{2}\text{-inch rifle (burst).} \\ 1 \text{ 8-inch Columbiad.} \\ 2 \text{ barbettes for field-guns (guns gone).} \\ 1 \text{ 32-pdr.} \\ 2 \text{ barbettes for field-guns (guns gone).} \\ 1 \text{ 32-pdr., navy (burst).} \\ 1 \text{ 8-inch Columbiad.} \\ 1 \text{ 8-inch siege mortar.} \\ 1 \text{ 24-pdr. gun.} \\ 1 \text{ barbette for field-guns (guns gone).} \\ 1 \text{ 8-inch Columbiad.} \\ 1 \text{ 32-pdr., navy.} \\ 1 \text{ 24 pdr. gun.} \\ 1 \text{ 32-pdr., navy.} \\ 1 \text{ barbette for field-gun (gun gone).} \\ 1 \text{ 4}\frac{1}{2}\text{-inch rifle.} \\ 1 \text{ barbette for field-gun (gun gone).} \\ 1 \text{ 32-pdr., navy.} \\ 1 \text{ 24-pdr. gun.} \\ 1 \text{ 7}\frac{1}{2}\text{-inch carronade.} \\ 1 \text{ 24-pdr.} \\ 1 \text{ 8-inch Columbiad.} \\ 1 \text{ 12-pdr. gun.} \\ 1 \text{ barbette for field-gun (gun gone).} \end{array} \right.$	$\left. \vphantom{\begin{array}{l} 1 \text{ 6}\frac{1}{2}\text{-inch rifled gun (burst).} \\ 1 \text{ 9-inch Dahlgren gun, occupying place of next—i. e.} \\ 1 \text{ 6}\frac{1}{2}\text{-inch rifle (burst).} \\ 1 \text{ 8-inch Columbiad.} \\ 2 \text{ barbettes for field-guns (guns gone).} \\ 1 \text{ 32-pdr.} \\ 2 \text{ barbettes for field-guns (guns gone).} \\ 1 \text{ 32-pdr., navy (burst).} \\ 1 \text{ 8-inch Columbiad.} \\ 1 \text{ 8-inch siege mortar.} \\ 1 \text{ 24-pdr. gun.} \\ 1 \text{ barbette for field-guns (guns gone).} \\ 1 \text{ 8-inch Columbiad.} \\ 1 \text{ 32-pdr., navy.} \\ 1 \text{ 24 pdr. gun.} \\ 1 \text{ 32-pdr., navy.} \\ 1 \text{ barbette for field-gun (gun gone).} \\ 1 \text{ 4}\frac{1}{2}\text{-inch rifle.} \\ 1 \text{ barbette for field-gun (gun gone).} \\ 1 \text{ 32-pdr., navy.} \\ 1 \text{ 24-pdr. gun.} \\ 1 \text{ 7}\frac{1}{2}\text{-inch carronade.} \\ 1 \text{ 24-pdr.} \\ 1 \text{ 8-inch Columbiad.} \\ 1 \text{ 12-pdr. gun.} \\ 1 \text{ barbette for field-gun (gun gone).} \end{array}} \right\} \text{Front of Attack.}$
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		1 24-pdr. gun.	} On parts of works not seen by our approaches.
		1 12-pdr. gun.	
		1 6-pdr. gun.	
		1 barbette for field-gun (gun gone).	
		1 breach-loading rifle, 21 $\frac{1}{2}$ in cal.	
		6 barbettes for field-guns (no guns).	
		1 42-pdr. carronade.	
		3 barbettes for field-guns (no guns).	
		1 42-pdr. carronade.	
		4 barbettes for field-guns (no guns).	
		1 42-pdr. carronade.	
		4 barbettes for field-guns (no guns).	
		1 42-pdr. carronade.	
		3 barbettes for field-guns (no guns).	
Flanking Battery to Ravine.	Redoubt.	5 8-inch Columbiads.	
	Battery.	4 8-inch Columbiads.	
	Battery.	4 32-pdrs.	
	Battery.	3 32-pdrs.	
	Battery.	2 32-pdrs.	
	Battery.	2 32-pdrs. (gone, probably removed since siege began, and mounted elsewhere).	
	Battery.	1 42-pdr. carronade, to sweep the beach.	
	Battery.	2. No guns in place.	} On beach, upper battery.
	Battery.	5. No guns in place.	
	—		

94.—Total arrangements for guns.

Of which we captured 53 guns in good order.

3 guns burst.

56

31 barbettes for field-guns.

7 embrasures for navy guns.

94.

(Signed)

J. G. BARNARD,

Brigadier-General and Chief Engineer.

REPORT OF FIRST LIEUT. C. B. COMSTOCK,
U. S. E.,

ACCOMPANYING HIS SKETCH OF THE FORTIFICATIONS AT
GLOUCESTER POINT.

CAMP WINFIELD SCOTT,
NEAR YORKTOWN, VA., *May 5th*, 1862.

GENERAL J. G. BARNARD,
Chief Eng. A. P., Head-Quarters.

SIR:--In compliance with your instructions, I have to-day visited Gloucester Point, and submit the sketch on the next leaf of the rebel works there. These works are two in number, namely, a water-battery on the extreme point, with its terre-plein only a foot or two above high-tide, and a large field-work on the bluff above. The water battery is **U** shaped, and has its rear closed; the guns and carriages were evidently navy ones; the parapet about 20'. thick, and interior crest about 7½' high, revetted and covered with turf. Embrasures also revetted with sods; the main magazine large, and well covered with bomb-proof shelter adjoining. Small magazines, marked C & D & F on the sketch; shot-furnaces A & B; and between each pair of embrasures an inclined bomb-proof blind, giving cover for the gunners. These blinds are made by leaning heavy timbers against the interior slope, where they rest on a frame, also resting against the interior slope. These timbers are together about three feet thick, and

are covered with sods; in the rear of the battery is a well by itself; there is a barbette gun, C, the only gun now in the work. The whole work is carefully and neatly finished; there are embrasures for twelve guns.

The field-work on the bluff is thirty or forty feet above the water, is a bastioned work of strong but variable profile, the parapet varying from fifteen to twenty feet in thickness, seven to ten feet in height; the depth of ditch and height of interior crest varying with the inequalities of the level of the ground. Several of the magazines serve as traverses. A long line of bomb-proof shelter, giving a long traverse in the centre of the work, had been begun; a well was in progress. In one place the parapet was not quite finished, and in another the revetment was incomplete. The works to cover the outlet had not been finished up; the revetment, like that of the water battery, was of sods; the finished portion of the work was well and carefully done. With these exceptions, guns and carriages were navy. Of these there were *en barbette* —. There were no embrasures.

The strength of the work is nearly the same as that of the work enclosing Yorktown.

(Signed)

Very respectfully,

C. B. COMSTOCK, *Lieut. of Engineers.*

N. B. The calibre of several of the guns bearing on the river and on our positions, is not given by Lieutenant Comstock.

There were eight in all; those not mentioned are believed to be as heavy as 32-pdrs.

(Signed)

J. G. B.

[The following reports, &c., not especially alluded to in my own Official Reports, are deemed of value and interest enough, as illustrative of the Engineering operations of the campaign, to be included in this volume.—J. G. B.]

REPORT OF A RECONNOISSANCE, BY LIEUTENANT C. B. COMSTOCK,

OF THE CONFEDERATE LINES ON THE WARWICK RIVER.

NEAR YORKTOWN, VA., *April 12th*, 1863.

GEN. J. G. BARNARD,

Chief Engineer Army of the Potomac.

SIR:—In accordance with your instructions, I have the honor to submit a report of a reconnoissance of the enemy's line of defence from Wynn's Mill (near works shelled by Captain Griffin) to the mouth of the Warwick river, with a sketch of the ground. As the survey and map of the roads by the Topographical Engineers have not yet been completed, the sketch herewith is but approximately correct.

From the statements of negroes and others, it is believed that Warwick river, so called, ends at Lee's Mills; that the stream above is called Beaver Trenches, and that this stream reaches above Wynn's Mill.

It is also stated that Beaver Trenches, above the pond of Lee's Mills, is a small stream, not more than ten or

fifteen feet wide and a foot or two deep; but that the marsh on its sides is very soft, to be crossed by footmen jumping from tussock to tussock. Of course these statements refer to the former state of the stream. From these statements it is also believed that there is a bridge and dam both at Wynn's and Lee's Mills.

The country back from Beaver Trenches and Warwick river is generally from fifteen to thirty feet above the water till you go a mile below Warwick Court House; then it is low.

The banks are generally wooded. One of the inhabitants said there was a place not more than half a mile below Lee's Mills where the river, not more than thirty or forty feet in width, might be crossed by a footman at low tide, but not without danger; that below it was everywhere at least five feet deep.

At present, above Lee's Mills, the marsh on the sides is partly or entirely under water; below, the marsh seems to be the common salt marsh of tidal waters; is generally covered with long coarse grass; is a foot or two above the water, and, from Lee's Mills to a point opposite Warwick Court House, is from 300 to 800 yards in width; then it suddenly spreads out, the river expanding and having an arm running off to the west.

Below Lee's Mills the river is very serpentine, gradually increasing in width, as you go towards its mouth, from fifteen to five hundred yards.

Above Lee's Mills the original stream is lost in the inundations. The first of these, going up stream, is caused by Lee's Mill dam, which backs the water up to a dam recently built, about one mile and a quarter by

the stream, above, leaving it a foot or two deep on the marsh below the dam. No work was visible covering this dam; it is believed that there was one brass gun at its opposite end. It was raining heavily when the gun was thought to have been seen. This dam floods the water nearly a mile back, to the foot of another new dam near Garrow's place, the dam being protected by a small battery, having, when seen, a single rifled field-gun, and able to hold a company beside.

The battery is protected by a small work fifteen or twenty feet above it on the slope, apparently a closed one; this has been built or unmasked since the place was seen on Sunday. This dam, doubtless, floods the water to Wynn's dam, which has not been seen; the water near it, one or two hundred yards in front of the enemy's works, has been seen to be at least fifty yards wide.

The enemy's line, then, south of Wynn's Mill, has a continuous water obstacle in its front; this obstacle being crossed by the bridge and dam at Lee's Mill, by the two new dams between this and Wynn's Mill, and by the bridge and dam at Wynn's Mill (which are possibly one).

In strengthening this line the enemy seem to have turned their attention mainly to Wynn's Mill bridge, Lee's Mill bridge, and what now appears to be their right—the large flat west of the river and south-west from Warwick Court House.

Wynn's Mill. Commencing at the proper left, the first work seems to be a square redoubt of good profile, stockaded in rear, and entrance on the north-west face;

then a parapet, perhaps of bastion *tracé* connected with another bastion by a stockaded curtain; last, a parapet broken to the front, on which men were at work three or four days ago. There may be another work still further to the south, on the edge of the inundation, which is believed here to turn suddenly from south to west; what looks like a parapet facing the south can be seen from the opposite edge of the inundation through the woods. Going down the stream, the one-gun battery and its redoubt, covering the upper of the two new dams, have already been mentioned. The next work is a battery (which may be closed) with one embrasure at the point, three-fourths of a mile above Lee's Mill, where the inundation turns suddenly to the south. This battery can doubtless fire down or up the inundation for several hundred yards, as well as on our shore—it is on a bluff thirty feet above the water.

Lee's Mill. The next works, going down the stream, are at Lee's Mill, and consist of a parapet of seemingly irregular form, believed to be directly opposite the bridge and mill; then, going down stream, two redans looking down a slight ravine; then a square redoubt, with a short detached piece of parapet behind it; and three or four hundred yards further down, at Southworth's Landing, what seems a redoubt, with gorge partly stockaded, the line being about half a mile long.

Works south-west of Warwick Court House. Nearly west of Warwick Court House the river makes a bend to the west, then winds round to the south-east, enclosing a peninsula. Opposite the northern face of the peninsula, partially hidden by pines, there is a small

portion of parapet visible; it is low, and in a low position.

Opposite the head of the peninsula there is what appears to be an open battery; then, running to the south-west, two bastions, apparently with abatis curtain; then two bastions with low curtain: these bastions having good relief and then a detached lunette. Looking beyond this, the James river apparently can be seen through the trees—one of the inhabitants said it was not more than half a mile beyond the works visible. If this be true, the right of their line rests on the James river. A man who said he had been over on Mulberry island, stated that the rebels had no force in the fort at Young's, had withdrawn their guns, and that it was only visited by cavalry patrols. The line seen must have been a mile or a mile and a half in length. In its front there is a large flat.

It is believed that the weakest part of this line is that just below the dam protected by the one-gun battery. The clearing at Garrow's place rises gently from the road toward the battery, giving cover for artillery within easy range, which could soon drive the enemy from the battery and the small redoubt in rear. It is not thought at all improbable that skirmishers might cross by wading, below the dam, notwithstanding statements as to the marshy character of the ground. No evidence has been obtained of any works in the immediate rear; there has however been much chopping, and there may be a line of abatis concealed by the woods in front. In one place, about one-fourth of a mile below the battery, a light place through the woods on the edge of the

stream seemed to indicate a clearing. If the dam next below were cut the preceding night, as might easily be done, the water below the dam, referred to above, would be lowered a foot or two. I have been told the rebels say the object of these dams is to drown any troops in crossing. I should have said that a man told me he had been at the works opposite Warwick Court House, and that three were built up all around (that is, were closed). He told me this without being asked, and I think it doubtful if it is true. I have not seen more than six or eight guns (light) in all the works (about eighteen) I have seen.

(Signed) Very respectfully,
C. B. COMSTOCK,
Lieutenant of Engineers.

REPORT OF AN EXAMINATION, BY LIEU-
TENANT C. B. COMSTOCK,

OF THE CONFEDERATE LINES ON THE WARWICK RIVER, AFTER
THEIR EVACUATION.

CAMP WINFIELD SCOTT, NEAR YORKTOWN,
May 4th, 1863.

Gen. J. G. BARNARD,
Chief Engineer A. P.

SIR:—To-day I went from the square red redoubt of the enemy, one mile south-west from Yorktown, across the corduroy crossing the stream called Warwick river, and down the right bank of that stream to the enemy's works at Wynn's Mill.

Across the marsh, at the end of the corduroy referred to, an infantry parapet begins, and runs parallel to the marsh and near the edge of it, continuously to a dam across the stream and marsh about a mile below. The end of the dam on our side (left bank of marsh) is covered by the infantry parapet (or rifle-pit) captured by our troops a few days ago and afterwards reoccupied by the enemy. The dam is commanded from the right bank by an epaulement for two or three guns: it was from this epaulement that our working parties near redoubt "A" were shelled a few days ago.

The infantry trench ceases to follow the marsh a few hundred yards below this dam, and the next works, as

the right bank of the marsh is followed down, are those in the large clearing which contains Wynn's Mill.

The sketch on the next page* gives the forms and positions with relation to each other of the heavy works at Wynn's Mill, and, approximately only, the position of the mill and stream; it does not show the numerous simple trenches which run both in front or in rear, between or on the flanks, of some or all of these works. These trenches extend some distance to the north-west of the square redoubt, which is the left (north) work at Wynn's Mill—run in rear of all these works except the redoubt, and south-west of the right (south) work are in two or three lines—one following the marsh down the stream. A peculiarity of much of this part of the trenches along the marsh is, the great number of traverses giving splinter-proof quarters for the men occupying the trenches. There is also a large amount of splinter-proof cover in the rear of the positions for guns, excepting only the square redoubt on the left.

The square redoubt was finished with great care and neatness, the others roughly. Most of the guns had sand-bag embrasures—one or two had splinter-proof blinds. No guns were left in the works.

Very respectfully,
(Signed) C. B. COMSTOCK,
Lieutenant of Engineers.

* Omitted: the plan of the siege of Yorktown shows the works at Wynn's Mill.

REPORT OF LIEUTENANT C. B. COMSTOCK.

SAME SUBJECT AS THE PRECEDING.

CAMP NEAR CUMBERLAND, VA., *May 14th*, 1862.

GEN. J. G. BARNARD, Chief Engineer A. P.

SIR:—In compliance with your instructions on the 8th inst., I examined the rebel works from Wynn's to Lee's Mills, and forward with this three sheets of sketches, showing rebel works at Wynn's Mill, at *one-gun battery*, so-called, and at Lee's Mill. The time at my disposal did not admit of making a survey of all the simple trench between Lee's and Wynn's Mills, nor of close examination of the whole ground. I will state, however, what I saw, but have not put on the sketches herewith.

About half a mile above Lee's Mill the stream makes nearly a right angle in its course. Now from Wynn's Mill nearly to this point there is a line of simple trench for infantry fire, interrupted only where it crosses small streams leading into the main one, and everywhere near the main stream or inundation. In many places there is another line of simple trench in rear of the first, especially in the vicinity of the batteries. At the bend in the stream referred to above, there is a break in the line

of trench, which, however, recommences a quarter of a mile above Lee's Mill, and runs down to the works at that place.

The dam next below the *one-gun battery dam*, at Garrow's place, is protected by a battery for four (4) in embrasure (two blinded), which is in turn supported by an elevated infantry parapet, nearly 200 yards long in its rear, and by a double line of simple trench.

The battery at the bend in the stream, formerly reported, is for one gun, and unsupported by any thing in rear. With these exceptions, the sketches show the line from Wynn's to Lee's Mill. In the report of a reconnoissance at Lee's Mill, made three or four weeks ago, it was stated that the rebels had a rifle-pit at Lee's Mill on our side of the stream. Those who said they had seen it probably mistook a stretch of sandy road seen through the bushes for a rifle-pit, as there is none there.

The sketch of works at Lee's Mill shows but one of a line of redoubts (square), which stretch to the westward from Lee's Mill, and of which I saw four, with intervals of 600 or 800 yards. The square redoubts seem to have been built several months ago, and are well and neatly built; those works which have been built lately (some within a month), have no pretensions to finish or good construction—revetment being absent or poor, and embrasures formed by piling a few sand-bags near the interior crest. This is true both at Wynn's and Lee's mills.

Very respectfully,

C. B. COMSTOCK,

Lieutenant of Engineers.

REPORT OF LIEUTENANT M. D. McALESTER,
ON THE CHARACTER OF THE CONFEDERATE WORKS AT WIL-
LIAMSBURG.

WILLIAMSBURG, *May 6th*, 1862.

Brig.-Gen. J. G. BARNARD:

In accordance with your order of this date, I to-day made a reconnoissance of part of the rebel fortifications in front of this place, and respectfully submit herewith a sketch of the same.* Arrived at No. 10, I met Lieutenant Farquhar, who had visited the three works on the enemy's left.

I have indicated in a general way the dispositions of troops on both sides, as far as relates to our main or central attack and our left demonstration. (Three regiments infantry, one battery, one company cavalry.)

The redoubts (except Fort Magruder) are nearly square, thirty yards to forty-five yards on a side, with platforms for two or three field-guns, and are well constructed. I found, however, in three instances, instead of field-pieces, the old-fashioned navy carronades on ships' carriages—a howitzer, very short, and about 6" calibre. Nos. 8 and 9 are epaulements, with one gun

* The sketch alluded to is replaced by a more accurate one, made under direction of General Humphreys.

each. Fort Magruder is a large work, irregular in *tracé*, two fronts being bastioned.

Allen's wharf was provided with a railroad track. Large storehouses there have been burned; the wharf and the road leading up from it indicate that large quantities of stores and numbers of troops have been landed there. Hampton Roads being closed by us, the enemy's entire communication with Norfolk was probably made at this wharf.

The road from Allen's wharf, joining the Williamsburg road at *N*, is good, and had circumstances permitted the prosecution of the movement to the enemy's right and rear, his only line of retreat could have been easily cut. *M* was a favorable position for a battery against No. 1, which had but one field-piece and one navy carronade, and has every appearance of having been occupied by but few troops. The epaulement near No. 1 has embrasures for two guns, but there are no signs of any ever having been mounted there.

Very respectfully, your obedient serv't,

(Signed)

M. D. McALESTER,

*Lieutenant Engineers,
Engineer 3d Corps A. P.*

LIEUTENANT M. D. McALESTER'S REPORT
OF THE BATTLE OF WILLIAMSBURG.

HEAD-QUARTERS, 3D CORPS ARMY POTOMAC,
Williamsburg, Va., *May 8th*, 1862.

Captain CHAUNCEY MCKEEVER,
Assistant Adjutant-General, 3d Corps Army Potomac.

CAPTAIN :—I have the honor to submit the following report and accompanying sketch of the positions occupied by the enemy, and those upon which were made our main or central attack and left demonstration, in the battle of Williamsburg; being the results of my reconnoissances of the 5th inst., during the battle, and the 6th inst., after the evacuation by the enemy of his positions. The sketch* is not laid down instrumentally, but can be relied on as sufficiently accurate for forming any conclusions regarding the dispositions of the battle.

At 7 A. M., on the 5th, you communicated to me at Adams's, on the Yorktown road, the General's order to report to General Hooker, who was then engaging the enemy on the Hampton road. I did so at 9 A. M., and he immediately sent me to reconnoitre the ground and enemy's redoubts to our left, these redoubts sending in upon him a hot artillery fire, while Fort Magruder, on

* See "Map showing the position of Williamsburg," &c. Lieutenant McAlester's sketch is omitted.

the road immediately in front, had ceased artillery fire altogether. I proceeded as rapidly as the almost impassable abatis would permit, to the ravine and salient of woods at "A," passing several regiments of our troops struggling slowly through towards the front. The abatis or entanglement here was a most formidable obstacle to the passage of troops. Arrived at "A," I saw Patterson's brigade disappearing through the woods as they deployed to the left. Presently a detachment of eight men of the New York 72d volunteers, under a sergeant, came up through the entanglement, and I immediately directed them to deploy forward to the advanced crest of the ravine, which crest was in the open space. I followed up, and there obtained a very good view of redoubts 2, 3, and 4 (see sketch), and of Fort Magruder. In the latter work I saw several regiments drawn up, apparently inactive, designed doubtless to prevent the carrying that fort (the enemy's central work) by storm, and to furnish supports to right and left. Redoubts 2, 3, and 4 were full of men, and 3 was firing rapidly upon our battery at "B" from two pieces, and it seemed to me the enemy had a field battery moving from point to point in the open space between his works, and delivering a fire upon various points of our advance; but I was unable to see it. Up to this time scattering musketry fire only was heard in the woods to the left. After observing at "A" for half an hour, I saw the enemy's troops commence filing rapidly, in the formation of skirmishers (not to attract our fire), from redoubts 2, 3, and 4, directly to the woods to their front and our left. This was the movement upon our

flank which annoyed us so much; came near, several times in the afternoon, attaining our rear; and resulted in the desperate fighting which raged so continuously all the afternoon up the wooded ravine from "C" to "D" and generally through the woods thereabouts. I then returned to General Hooker and reported the results of my reconnoissance, which amounted to the then following conclusions:—1st. That the ravine at "C" was impracticable for artillery designed to be put into position on the enemy's plateau at this point, and that it would be difficult to get a battery into position on our side of the ravine, in consequence of the large number of trees we would be obliged to fell to unmask it; besides, I had serious doubts whether the battery so placed would prove efficient, in consequence of the crest of the ravine towards the enemy being higher than the one on our side. 2d. That our troops had better be passed to the front, either up the road or around through the woods, instead of *through* the entanglement. 3d. That the open space constituting the enemy's position extended, APPARENTLY (from my point of view), considerably beyond his right redoubt, thus affording a probable chance of getting at his right or rear (redoubt No. 1 I could not see). The last conclusion, or supposition, I communicated to the Brigadier-General Commanding, on his arrival. At about 2 P. M., he directed me to pass around to the enemy's right, and see what chance existed of turning his position. I retraced the Hampton road to "E," passed Averill's cavalry at "F" (his pickets were some distance in advance), and went far enough up the road on Allen's

estate to derive the conclusion, that the opening where the enemy's works were, and that on Allen's estate, were either continuous or very near together, and that a movement around there might be decisive. (This conclusion proves to have been partly erroneous (see sketch), the two openings being separated by woods more than a mile across, and two small streams, branches of the Ackershape, and connected by a good straight road "*G*" "*H*" (see sketch), unobstructed, passing through the woods, and crossing the two streams upon mill-dams in perfect order.) This conclusion I immediately reported to the General. At about 4.30 P. M., by the General's order, I returned to Allen's estate, to hasten General Emory's proposed movement upon the enemy's right and rear, and overtook him moving forward towards "*G*" with three regiments of infantry, one battery, and a detachment of cavalry. Arrived at "*G*" we discovered the mill-pond "*K*," crossed on the dam by the road "*G*" "*H*." After considerable deliberation, General Emory decided that his force was inadequate to attempt the movement along "*G*" "*H*" upon the enemy's right and rear, he at that time being, of course, ignorant of the fact that the road struck the enemy's right at redoubt No. 1, and then passed to his (the enemy's) rear at a point nearer Williamsburg than was the enemy's centre at Fort Magruder. General Emory's force was undoubtedly too weak to attempt cutting off the enemy's retreat.

A careful examination of the enemy's position intensifies the regret, that the pressing and repeated demands by the Brigadier-General Commanding, made

immediately on his arrival at Hooker's position, and subsequently, for reinforcements, had not been promptly complied with, in order that his desire to turn the enemy's position, by diverting Kearney's division around by Allen's estate, might be carried out. Had these conditions been fulfilled, the enemy must have countermanded his flank movement up the wooded ravine "C" "D," thereby saving part of the terrible carnage there, and his retreat must either have been entirely cut off, or converted into a complete night rout.

Allen's wharf, and road leading up from it, have been extensively used by the enemy. Several storehouses have been burned there. I have the honor to be,

Very respectfully,

Your obedient servant,

(Signed)

M. D. McALESTER,

Lieutenant Engineers,

Engineer Officer 3d Corps A. P.

REPORT OF LIEUTENANT M. D. McALESTER,
OF A RECONNOISSANCE AT BOTTOM'S BRIDGE.

HEAD-QUARTERS 3D ARMY CORPS, A. P.,
BALTIMORE STONE, *May 22d*, 1862.

BRIG.-GEN. J. G. BARNARD,
Chief Engineer Army of Potomac.

GENERAL:—Your order to push a reconnoissance beyond the Chickahominy at Bottom's Bridge, dated yesterday, I received at 12 M. of that day, and immediately started to execute it. Arrived at General Keyes's headquarters (at the house where we dismounted the previous day), the General informed me that Lieutenant Comstock had just left with an escort (Colonel Russell's regiment) to commence the reconnoissance.

I overtook him at the bridge, which troops of the line were already engaged in repairing, a few troops being stationed in the immediate vicinity on the other side, to protect the working party. We immediately threw our men forward as skirmishers, and proceeded to Bradley's (see sketch). There we took up one of Bradley's negroes to act as guide. He stated that a road led up to the left, to a farm occupied by Mrs. Carter. We did not go there. I represent the road and farm according to the negro's description.

We proceeded to the chimneys (we saw them from

this side on the 20th). The guide stated that, early in the morning of the 20th, the enemy's two light pieces of artillery were in position at this place. Subsequently they were moved to *a*, close to a family vault. I estimate the distance from the bridge to the chimneys at 1,200 yards. While at the chimneys, Colonel Sweitzer came up, and subsequently brought up some cavalry, I believe. From the chimneys (having examined the position well) we extended the reconnoissance to the right, through a dense wood, to the farm-house at *A*, and thence down to the railroad at *B*, sweeping the woods well with skirmishers. The highest point of ground is at the chimneys. From that point a crest extends to *A*, and thence to *B* (red dotted line). This crest line descends gradually from *A* to *B*. The point *C*, in the open cultivated space at that point, is somewhat higher than the ground at *B*. With this exception, the crest, represented by the red dotted line, is not commanded by the ground in the immediate front, or as far as we could see. In fact, the summit level is reached at that line, and the ground descends immediately from that line towards the river, with various degrees of declivity.

From the house *A*, we heard musketry, or carbines, open fire at *D*, on the road; and after our arrival at the railroad we heard several discharges of the enemy's light artillery, and concluded that our cavalry had met that of the enemy at that point.

The pickets at the railroad bridge stated that the enemy had a cavalry and artillery force on the railroad in front.

I neither heard nor saw any thing indicating that the enemy had more in the vicinity of these bridges than a regiment of cavalry, accompanied by two very light pieces of artillery. Neither did I see or hear any thing *conclusive* that the enemy had not a large force within two or three miles of the bridges.

My impression is that the cavalry and light pieces are the only force there. The infantry encampments, scattered everywhere through the woods, showed signs of very hasty abandonment.

We returned *via* the railroad bridge to Bottom's Bridge, arriving at 7 P.M. General Keyes had already passed ten regiments over to picket the line reconnoitred.

Lieutenant Comstock having orders to report to General Keyes, I, with his acquiescence, returned to these head-quarters. Lieutenant Comstock said he would detail the disposition of abatis and earthworks proposed, in his report to you.

Very respectfully,

Your obedient servant,

(Signed)

M. D. McALESTER,
Lieutenant of Engineers.

REPORT OF BRIG-GEN. D. P. WOODBURY.

OPERATIONS OF THE ENGINEER BRIGADE, FROM JUNE 1ST TO
JUNE 7TH.

HEAD-QUARTERS, ENGINEER BRIGADE,
CAMP NEAR NEW BRIDGE, VA., *June 7th*, 1862.

GENERAL J. G. BARNARD,
Chief Engineer A. P.

GENERAL:—I have the honor to render the following report of the operations of the 15th and 50th regiments, composing the Engineer Brigade, for the first week of the month of June.

A detachment of the 15th regiment, under Captain Ketchum, was employed for several days getting out lumber at the saw-mills, when the shaft of the balance-wheel broke and rendered the machinery useless. The lumber was delivered to Lieutenant Nichols, 4th Vermont Volunteers, by order of Colonel Alexander.

The further operations of Captain Ketchum's detachment are contained in Colonel Murphy's regimental report, from which I extract the following:

"Captain Ketchum relieved Captain Brainard, of the 50th regiment, to build a trestle bridge one mile below New Bridge. Owing to the shifting character of the bottom and the sudden rise of water, much delay was experienced, but at 2 o'clock A. M., on the 2d inst., a

bridge, 330 feet in length, consisting of seven trestles and seven pontoon-boats, was constructed. Captain Ketchum was assisted in this work all night by a detail from the regiment under Major Magruder.

"Until the 5th inst., Captain Ketchum's men were employed in framing supplemental supports to trestle-caps, lashing side-rail, and straightening up trestles, &c., on account of the fall of the water.

"Subsequently he was detailed to relieve Captain Chester, at the lower foot-bridge, where he was again assisted by a detail under Major Magruder.

"This work was continued until 9 P. M. of the 5th, when, owing to the darkness, and the cramped condition of the men, from long-continued standing in the water, the work was stopped, after laying upwards of 500 feet of bridge.

"Captain Ketchum is now framing the timber for a permanent structure (New Bridge), the bridge previously framed by him having been used by the U. S. Engineers, under Captain Duane. In this work, Captain Ketchum is assisted by a detail of carpenters from the 50th regiment.

"The second detachment of the 15th, under Captain Chester, has been employed in cutting and preparing corduroy material, and also on the following pieces of work:

"1st. A road leading from the rear of General Smith's head-quarters to the New Bridge road. (North-west-erly.)

"On this there was a distance of about half a mile that was graded, by throwing out sand from ditches.

and many spots were corduroyed, and five small bridges built.

"2d. A continuation of the trestle bridge laid by Captain Spaulding. In this, Captain Chester's men were assisted by a detail from this camp, working at night. The road passing the skirt of woods approaching this bridge has been corduroyed for a long distance.

"Captain Spaulding's bridge terminated abruptly in deep water, and in order to continue it, all the trestle and pontoon material that could be found was used before commencing with corduroy. The whole distance of crib and corduroy, from the termination of the trestle bridge to the point now completed, is 900 feet. Of this, some 400 feet of corduroy requires adjusting before heavy artillery can safely pass; and one place, of about thirty feet in length, is still open, but will be closed to-day. Stringers are also partially in position in advance, and Captain Chester is quite confident that all the material portion of the bridge will be completed to-day.

"3d. A foot-bridge for infantry, where General Magley commenced a crossing of the creek.

"This bridge is now 760 feet in length, and crosses two deep channels, in which the water was respectively seven and nine feet deep.

"Last night, when Captain Chester withdrew the detachment, there was no spot between the end of this bridge to the one already constructed by General Magley, in which the water was over one foot deep; and as the distance is not over 250 feet in length, the water rapidly falling, and most of the material already pre-

pared, it will probably be entirely completed to-day. It is proper to state, that the difficulty of constructing this bridge was materially increased for the following reasons, viz. :

“All small corduroy or crib material was cut and prepared at a distance of more than a mile from the bridge. The road intervening was impassable for teams, at one time being covered with water, for a distance of one hundred yards, from fourteen inches to three and a half feet in depth.

“This detachment spent the whole of one stormy night in temporarily arranging this road, in order that the teams furnished to haul corduroys might be rendered available.

“For this purpose, they carried several thousand rails a distance of 400 yards. At daylight the same men commenced the bridge, and completed a length of 140 feet during the morning, when they were relieved by a detachment under Major Magruder, who advanced the work about 500 feet more. Yesterday a further force of sixty-five men, under Lieutenant Lubey, and six wagons, were sent to assist.

“In addition to the work done by these separate detachments, a foot-bridge, constructed on small trestles, has been built for a distance of about 1,200 feet across the river and overflowed bottom land, near the bridge built by Captain Ketchum. The main stream was spanned by three canvas pontoons, with their accessories. It is now in a condition for the passage of infantry, in single file.

“In obedience to your orders, during the storm on the

night of June 3d, Major Magruder, with 117 men, built a rifle-pit across the west end of Captain Ketchum's bridge, for the protection of those guarding it."

Of the 50th regiment, one company is stationed at White House, in charge of pontoon and intrenching property—engaged for the last few days in loading pontoons and their accessories on the cars, to send to Despatch station. A detachment under Lieutenant Hine has been stationed at Bottom's Bridge, for the purpose of guarding and strengthening the two trestle bridges at that point. Lieutenant Hine reports as follows:

"During the day and night of the 1st, the water remained stationary at 3 A. M. On the 2d inst. the river suddenly commenced rising at the rate of six inches per hour! and by 8 A. M. the bridges were impassable, all of the approaches being washed away. I applied last night in person to General Heintzelman—sent a despatch to the nearest brigade (3d Hooker's Division) this morning, then went myself for men, but it was 10 o'clock before any were on the ground, and 1 o'clock before communication was open across the bridge.

"At 10.30 A. M. the water was three feet and two inches higher than at 3 A. M., when it commenced rising, and the bridges in imminent danger of being swept away, when, as a last resort, I cut the dikes on both sides of the river between here and the railroad bridge, inundating the whole valley, but spreading the water so much that it rose no higher. By this the bridges are saved, and I have 200 men now at work raising the approaches and completing the timber bridge I had commenced.

"By daylight to-morrow morning I shall have a bridge twenty-four feet wide completed, capable of sustaining any required weight.

"I have kept General Heintzelman apprised by telegraph during the day of the condition of the bridge, so that no serious interruption has occurred."

On the 4th inst. Major Embick, with a detachment of two companies, was sent to Bottom's Bridge to assist Lieutenant Hine. This detachment has constructed a permanent bridge, double roadway, of the strongest description: two spans thirty feet; four spans fifteen feet; length 120 feet; width of roadway twenty-four feet. The approaches on either side have been corduroyed for the distance of 1,200 and 1,300 feet, under the direction of officers of this detachment. This bridge will render unnecessary the two trestle bridges at this point.

A detachment under Captain Spaulding was directed to construct a trestle bridge half a mile above New Bridge. Captain Spaulding reports on the 2d inst. as follows:

"Owing to the sudden rise of the river having floated all the bridge material at the point where it had been deposited, to prevent its being observed by the enemy, it became necessary for me to remove all the material to higher ground, to prevent its being carried off before it could be used in the bridge. As this work was nearly all done in the water, the operation was necessarily a slow one, so that I did not get to work at the construction of the bridge until about daylight.

"When I had the bridge about three-fourths completed, the second trestle-cap from the bank broke,

making it necessary for me to dismantle all of the bridge except one span, to put in a new cap.

“When the bridge was again entirely completed across the main stream, I found that the rapid current was fast undermining the legs of the trestle in the main channel, and I was compelled to dismantle forty feet of the bridge about the centre, and put in one of the pontoon-boats.

“Owing to the delay caused by these reconstructions, the time occupied in constructing the bridge was longer than I had expected; but the south abutment was put in and the bridge finished at noon yesterday.

“When the bridge was completed yesterday I returned to camp, leaving the approach at the south side of the river to be built by Captain Chester. During the construction of the bridge, the approach on this side was built by Captain Perry of the 15th, who also rendered me valuable assistance in securing the north end of the bridge. With the slight changes suggested by you, to accommodate the bridge to the falling or lower stage of water, and which I hope to have finished before the south approach is ready for use, the bridge is perfectly secure for infantry in two ranks, and as safe for the passage of artillery as this plan of trestle can be made without strengthening it beyond the original plan. This bridge is —— feet in length.”

Colonel Stuart, in his regimental report, speaks in the highest terms of the skill, energy, and endurance exhibited by the officers and men engaged on this work, and of their great exposure in the stream, which had become very deep and rapid before the trestles could be placed

and secured, and of their utter indifference in regard to the enemy's shot and shell, which fell at one time in close proximity to them.

The bridge has been strengthened by placing piles beneath the trestle-caps, to prevent injury from the extreme high water.

A detachment under Captain Brainard commenced the lower trestle bridges on the night of May 31st.

Of the difficulties attending the construction of this bridge, Colonel Stuart says:

"One hundred feet of the trestle bridge, which had been prepared for the stream when at low-water mark, and made up without a pontoon-boat, was not of sufficient length nor of the right character for the stream, swollen as it was by the recent rains on the night the work was commenced. Added to this, the unlooked-for and remarkable rise of water on Sunday morning, rendered it necessary for the men engaged in the construction of this bridge to work for nearly twelve hours in the cold water, frequently having to dive to place the legs of the trestles, and swimming to reach the opposite bank, and this, too, mostly in the darkness of the night."

RECAPITULATION.

BRIDGES.

One permanent bridge at Bottom's—2 spans 30 feet; 4 spans 15 feet; length 120 feet; roadway 24 feet: by a detachment of the 50th under Lieut. Hine, assisted in the end by 2 companies of the 50th under Major Embick.

One trestle and pontoon bridge (6 trestles, 4 pontoon-boats) about one mile above New Bridge, by a party of the 50th under Capt. Spaulding. Length of the bridge, 207 feet. 900 feet of crib and corduroy on south approach, by various details from the army, assisted by a party of the 15th, under Captain Chester.

One trestle and pontoon bridge about one mile below New Bridge, of seven trestles and seven pontoons; length, 330 feet: by a party of the 15th, under Captain Ketchum.

One foot-bridge about $1\frac{1}{4}$ mile below New Bridge, of small trestles covered with plank; 3 canvas boats span the main channel; length across the river and overflowed bottom lands, 1,200 feet; by a detachment of the 15th, under Colonel Murphy.

One bridge for infantry $2\frac{1}{2}$ miles below New Bridge, connecting with General Nagley's bridge—length, 1,010 feet; width, 4 feet: by the 15th, under Captains Ketchum and Chester.

Five small bridges on the road from General Smith's head-quarters to New Bridge, by detail from the 15th, under Captain Chester.

ROADS.

2,500 feet graded and corduroyed, on road from General Smith's head-quarters to New Bridge: by detail from the 15th, under Captain Chester.

500 feet corduroyed, over bottom land on the north approach to the infantry bridge: by details from the 15th, under Captain Chester.

Rifle-pit 50 yards in length, constructed for the protection of the south approach of the lower trestle bridge, by details from the 15th, under Major Magruder.

(Signed) D. P. WOODBURY,
Brigadier-General Volunteers.

REMARK.—The recapitulation conveys, probably, all the information General Barnard will find it necessary to notice in his records.

(Signed) D. P. W.

LETTER OF COLONEL RICHARD DELAFIELD, ENGINEERS,

DESCRIPTIVE OF "MANTLETS," OR EMBRASURE BLINDS, PRE-
PARED UNDER HIS DIRECTION.

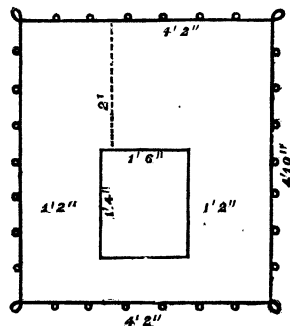
NEW-YORK, *April 22d*, 1862.

GENERAL :—By request of General McClellan I have had made a number of rope mantlets, or embrasure blinds, for your siege-batteries. His desire was to have 100 of them made of rope. The material could not be found in the market; twenty-five is all that could be manufactured to be finished by to-morrow night, the rope for part of which is being made at the ropewalks.

That you should not be disappointed, I have in progress seventy-five of half-inch wrought iron, secured to three-inch oak plank. These are every way more reliable than rope, although they have the disadvantage of splinters from cannon-balls.

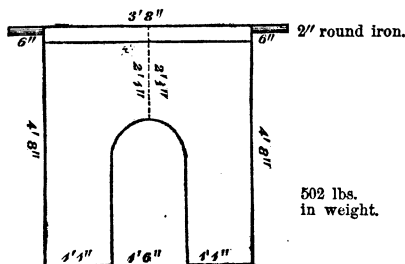
Yesterday fifteen of the rope mantlets were forwarded by rail to Belger, in Baltimore, to be sent to you by first conveyance, *viâ* Old Point. They were of the annexed dimensions.

These are made of six-inch rope, in three thicknesses, with



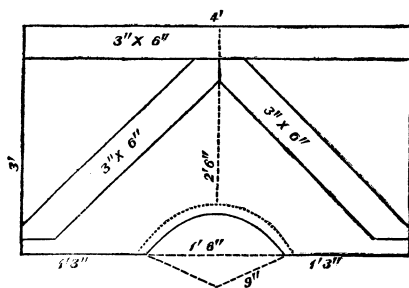
loops at the four corners, and eyelet-holes in the four sides, that you may arrange them to suit your embrasure openings, and the calibre of gun in battery.

Three more of these rope mantlelets will be forwarded this evening, and at least twenty-five of iron backed by oak wood.



They are made as in the annexed sketch, of two thicknesses of quarter-inch wrought iron, spiked to three-inch oak plank every six inches. On the head is a two-inch square

iron bar, riveted to the edge of the iron plates, against which the oak plank abuts. The ends of this bar project six inches, and are rounded, serving as supports, to rest upon upright stakes or timber, resting against the interior slope of the parapet. I have made the width of the gun-opening eighteen inches, the top having two feet of solid above it. These dimensions have been assumed, and without any information as to the character of the calibres of guns to be put in battery.



Apprehensive that some difficulty may arise on this score, I have ordered fifty others of the dimensions and form given in the annexed sketch, which is two thicknesses of wrought

iron of $\frac{1}{4}$ -inch each, bolted together every six inches

with $\frac{1}{2}$ -inch rivets, to which plates are bolted on top, an oak piece of 3×6 inches, and two diagonal pieces of same dimensions; a segment of nine inches radius and 1' 6" chord, or 6" versed sine, is cut out of the bottom. The rivets about this segment are set off from the edge of the opening, to admit of your cutting it larger, and lowering it. This kind will have 2' 6" solid above the opening; the other iron ones, as also the rope ones, have two feet of solid above the gun-opening. The latter kind, $4' \times 3'$, will admit of being placed somewhat inclined in the embrasure, and thus *reflect* grape, canister, and musket. To-morrow and next day, the 23d and 24th, will enable me to send forward the whole order, to wit: twenty-five rope, and seventy-five wood and iron blinds. I will send a box of cold chisels, to enable you to cut and alter at pleasure.

Very truly and respectfully,
(Signed) RICHARD DELAFIELD,
U. S. Corps of Engineers.

GENERAL BARNARD, *Yorktown.*

SPECIAL REPORT OF BRIG.-GEN. D. P. WOOD-
BURY, MAJOR OF ENGINEERS,

OF THE OPERATIONS OF THE VOLUNTEER ENGINEER BRIGADE AT
WHITE OAK SWAMP BRIDGE.

KEY WEST, *May 30th*, 1863.

GENERAL:—About one o'clock in the afternoon of the 27th of June, 1862, General McClellan, then breaking up his camp near Dr. Trent's house, on the south side of the Chickahominy, sent for me and told me to take the Engineer Brigade to the White Oak Swamp, and make as many bridges as I thought necessary for crossing the army over that creek and swamp.

I had received no intimation from any person that such orders were coming; still I was expecting them, and had the pontoon train already harnessed up. It was started immediately, in charge of Major Spaulding. The remainder of the brigade started soon afterwards.

At Savage's Station, Major Spaulding found the road to the White Oak Swamp already occupied by troops on their way to that place. The artillery and baggage-wagons very soon cut up the road, and it was midnight before the pontoon detachment reached the crossing.

I had gone on in advance, and arrived at the headquarters of General Peck, on the left bank of the White Oak Swamp, about three P. M.

I found that General Peck, to keep the enemy out, had cut down the dense and heavy woods along the bottom of the creek, beginning below the proper crossing and extending several miles above. He was still busy at this work, and that very day had obstructed the road leading to the crossing, and the crossing itself, with very heavy trees. At my request, he immediately detailed a large force of choppers to clear out these obstructions. They continued their work long after dark, resumed it early in the morning, and finished it a little before 7 o'clock on the morning of the 28th. By that time the bridge-builders, beginning at daylight, had repaired the old bridge. The two or three wooden bents or piers, about sixteen feet apart, were still uninjured. Our common balks and chess formed the superstructure, which, with added intermediate piers, was found to be strong enough to bear artillery. Troops, artillery, and baggage-wagons, of the corps of General Keyes, immediately began to cross.

During the day of the 28th, a foot-bridge was made immediately above the regular crossing, and another immediately below. An excellent crib bridge, with corduroy approaches, commenced by Colonel Stuart, 50th New York, on the morning of the 28th, was completed early on the morning of the 29th, its place being a few yards below the old bridge. In the mean time, Major Magruder, with a detachment of the 15th New York, prepared a rough but passable artillery crossing over the swamp and creek, about a mile above the regular crossing.

The bridges, as fast as completed, were in use day and night, until an early hour on the morning of the 30th,

when every wagon and every man, except a few stragglers, had crossed over.

No orders were given to me, on this or any other occasion, to superintend the use of common bridges,—a thankless, disagreeable, and very difficult duty, which I often assumed when I found no one else specially directed to attend to it. I assumed this duty at White Oak Swamp, and as the subject is important, and not generally understood, I will give a brief account of it, as illustrated at that particular crossing.

On the 28th, the wagons came to the crossing in one line only,* each teamster thinking that if he left his place in the line he should lose his chance at the bridge. On the bridges and their approaches there was never any delay, but on the one road then in use delays were so numerous that the crossing was unoccupied, probably, three-fourths of the time. The first improvement consisted in forming a second line of wagons on a separate road, joining the main road at the bridge. With these two *feeders* the bridge did double work, but was still idle more than half the time. Secondary *feeders* of the two main lines were then formed—our superintendence extending back as far as two miles from the bridge.

In like manner, three *outlet* roads were found necessary and sufficient to keep the bridges clear. We increased the sub-division of lines until the bridges were fully occupied. Had the roads been much worse we should have formed many more lines, and could still have kept the bridges occupied.

* The crib bridge was used by the wagons and heavy artillery. The old bridge was reserved for the troops.

This duty of superintendence was well performed by the Engineer Brigade—it was kept up forty-eight hours without intermission. Captain Hine, of the 50th New York, distinguished himself, as usual, by his intelligence and energy. Lieutenant-Colonel Colgate, of the 15th New York, was equally distinguished.

The old bridge on the south side of the crossing was reserved for the use of troops, and it was no small part of our task to keep these troops on the right side of the artillery, and wagons on their own bridge.

By causing teams to move at a fast walk over a bridge and its approaches, 3,000 wagons can be taken over a single bridge in twenty-four hours, in any state of the roads, provided the roads are not absolutely impassable.

This notice of the bridges, and of the transit of the army over White Oak Swamp, is furnished in part from memory, but is substantially correct.

Respectfully,

D. P. WOODBURY,

Brigadier-General.

General J. G. BARNARD, *Chief Engineer*,
Washington, D. C.

Scott's Military Dictionary.

Comprising Technical Definitions; Information on Raising and Keeping Troops; Actual Service, including makeshifts and improved materiel, and Law, Government, Regulation, and Administration relating to Land Forces. By Colonel H. L. SCOTT, Inspector-General U. S. A. 1 vol., large octavo, fully illustrated, half morocco. \$5.

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